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LECTURE III.

THE HÆMOLYTIC ANÆMIAS.*

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Anæmia from hæmolysis or increased destruction of red corpuscles is uncommon. It presents problems of great difficulty. Cases are rare, and in the published reports essential details and investigations are lacking. Knowledge that powerful hæmolysins can be elaborated by bacteria has prejudiced the approach to the problem and prevented the orderly accumulation of facts. A natural confusion with anhæmopoietic anæmias such as pernicious anæmia has been a further bar to progress. I propose first to discuss briefly hæmolytic anæmias whose pathology is understood. Afterwards, in the light of the knowledge acquired from these anæmias and from our previous study of the erythron and its diseases, it may be possible for us to discern some unifying or distinguishing features in the hæmolytic anæmias of unknown origin which remain for consideration.

The most important group of hæmolytic anæmias is constituted by those of congenital or familial origin: acholuric family jaundice, sickle-cell anæmia, the erythroblastic anæmia of infants, and icterus gravis neonatorum. For information about acholuric jaundice I am fortunate in being able to refer you to our President's comprehensive studies.[15] Acholuric jaundice and sickle-cell anæmia are dependent on the presence of an abnormal type of corpuscle, which is ill-adapted to life in the blood stream, but the factors which determine the degree and the variations in hæmolysis are obscure. The pathology of the erythroblastic anæmia of infants is unknown.[77] Icterus gravis neonatorum is a most interesting disease, which may shed light on the mechanism of the acute anæmic breakdowns of later life and which therefore deserves rather longer mention. In this grave familial jaundice, successive infants in a family become jaundiced a few hours to a day after birth. They become progressively anæmic, pass into a drowsy condition, and usually die in a few days or weeks. The disease resembles physiological jaundice in its onset, and, like it, it does not show any gross post-mortem appearances to account for the jaundice.[61] During intra-uterine life the red cells circulate in higher concentration than after birth to compensate for the poor supply of oxygen from the placenta. It is probable that physiological jaundice results from the hæmolysis of superfluous corpuscles on the adoption of pulmonary respiration, and that grave familial jaundice is a morbid exaggeration of this process. Affected children nearly always died till Hampson showed that they could be cured by the injection of normal human serum, and that after this they developed normally. This is a close parallel to the striking effects of transfusion in the acute anæmic breakdowns of later life. In conclusion, we may observe that liver is of little or no value in any of these familial hæmolytic anæmias. The decrease in hæmolysis and the improvement in the patient which follows splenectomy in acholuric jaundice are well known. Unfortunately this operation seems to be of no such constant assistance in sickle-cell anæmia or in the erythroblastic anæmia of infants.

CAUSES OF HÆMOLYTIC ANÆMIA.

Hæmolytic anæmia may be the result of a variety of infections[39] and organic or inorganic poisons. It is exceedingly uncommon for the ordinary streptococci to cause a hæmolytic anæmia; anaerobic streptococci, such as are often responsible for puerperal fever, are more potent, but the organism which stands out above all others is *Bacillus welchii*. In gas gangrene profound anæmia may develop in a few days or hours, the red cells are destroyed so rapidly that hæmoglobin and its derivatives may appear in the urine, there is frank jaundice, the white cells are increased to 50,000 or more, and myelocytes appear in the blood. In the effort to repair this sudden destruction of red cells, erythroblasts of the most primitive type are poured into the blood stream and there is a great reticulocytosis. Recovery is rapid and spontaneous if the infection is overcome. In these anæmias from infection, there is rarely any doubt about the presence of a gross infection and the organisms can be cultivated from the blood. It must be remembered that anæmic patients are very unresistant to infection, especially by streptococci, and many mistakes have been made in attributing anæmia to infection, when a more careful history would have shown that the infection was the complication or termination of a pre-existent idiopathic anæmia.

Hæmolytic anæmia has been described in typhoid fever,[36 66] disappearing when the disease was cured, but here there is the possibility that the condition was an Addisonian anæmia due to the disease of the alimentary tract and not a hæmolysis. There is, however, one infection both in man and animals, of which the most characteristic feature is a hæmolytic anæmia. In bartonella infection,[70] which in man is known as Oroya fever, the red cells are invaded by the organisms and broken up, often with resultant hæmoglobinuria and jaundice. A profound anæmia of a megalocytic type soon develops, and again there is a leucocytosis and the outpouring of immature red and white cells from the marrow. We must all agree that these hæmolytic anæmias, in which the red cells are destroyed by the direct action of organisms or their poisons, are extremely uncommon except for gas gangrene and puerperal fever. Equally uncommon is hæmolysis by the direct action of poisons such as the aniline derivatives, though it may occur in industrial accidents and in suicides, and it is identical with the effects of bacterial hæmolysins.

More frequent are the hæmolytic anæmias which appear to be the indirect result of an infection or harmful agency, such as the paroxysmal hæmoglobinuria of syphilis and the blackwater fever of malaria. Here the infecting organism does not act directly on the red cells, but apparently produces a

* The third Goulstonian Lecture for 1932 delivered before the Royal College of Physicians of London on March 8th. Lectures I. and II. have appeared in previous issues of The Lancet.

change in the patient's organism, which leads to hæmolysis under special conditions of temperature, medication, and so on. Closely related to these diseases is Fabismus, a hæmolytic anæmia found in Italy, which follows the ingestion of beans (*Vicia faba*) or even the inhalation of their pollen.[60] It is probably due to sensitisation to some constituent of the plant. Nothing happens to the patient on first eating the beans or coming into contact with the plant, but on the second occasion, perhaps months later, there is a rapid hæmolysis of the red cells, often with hæmoglobinuria and always with anæmia. Finally we may mention the hæmolytic anæmia which may develop in man and animals as the result of frequent transfusion with a perfectly compatible blood. An animal so treated learns to dispose of the transfused cells with increasing celerity, and in certain cases the hæmolytic process may not stop at the destruction of the superfluous cells but may progress and produce a severe hæmolytic anæmia.[63]

CHARACTERISTICS OF HÆMOLYTIC ANÆMIA.

We are now in a position to describe the characteristics of a hæmolytic anæmia. It may develop with very great speed and then disappear as soon as the hæmolysed cells can be replaced, or it may be chronic and persistent, or it may run a chronic course with periodic exacerbations. If a great many red cells are broken down in a short time, there are hæmoglobinuria and jaundice, but in chronic hæmolytic anæmia it is sometimes surprising how slight is the jaundice. The colour-index varies according to the mode of reaction of the bone-marrow but it is usually round about unity and there may be frank megalocytosis. Owing to the vigorous attempts of the bone-marrow to repair the anæmia, the reticulocyte count is high, and nucleated red cells and even megaloblasts appear in the peripheral blood. The fragility of the red cells varies in different individuals and at different times in the same individual. The resistance to hypotonic saline may be diminished in acquired hæmolytic anæmia, and it may be normal in congenital acholuric jaundice.[15] In chronic hæmolytic anæmia the white cells are unaffected or a little diminished. When hæmolysis is acute and rapid, there is a leucocytosis during which very immature white cells may appear in the peripheral blood; the platelets first fall and later rise above their normal level. Apart from the hæmolysis, which gives rise to the depressing effects of anæmia, enlargement of the liver, spleen, and occasionally of lymph glands, hyperplasia of the bone-marrow and hæmosiderosis, there are no signs of systemic disease, and the alimentary tract and nervous system are normal. In the ætiology of these anæmias we can distinguish three different kinds of factor: first, a hereditary dystrophy of the erythron; second, immediate destruction of erythrocytes by micro-organisms, toxins, and chemical agencies; third, hæmolysis from morbid changes in the body fluids and the reticulo-endothelial system, which may be the result of infections, poisons, or other agencies.

Chronic Acquired Hæmolytic Anæmia.

I have thought it unwise to attempt any formal classification of the obscure, hæmolytic anæmias which remain to be considered, and I shall merely divide them into two groups. In the first group, which I shall call *chronic acquired hæmolytic anæmia*, the hæmolytic process persists once it has been established, though it is often subject to periodic exacerbations. In the second group, which I shall call *acute hæmolytic anæmia*, the disease is self-limited, and if the patient survives the crisis of the illness, complete recovery occurs in a few months or at any rate within a year. I can best describe chronic acquired hæmolytic anæmia by reporting the following case:—

A woman, aged 29, was admitted to Guy's Hospital on April 18th, 1931. Her illness began suddenly in March, 1929, with the passage of bloody urine, followed in 24 hours by jaundice. The hæmoglobinuria persisted for five days and left her extremely weak, so that she was unable to rise from her bed for six weeks. Her previous history was negative, and no other member of the family had ever had anæmia or jaundice. Similar attacks occurred at Christmas, 1929, and in March, 1930. She was not strong enough to travel till June, 1930, when she was taken to a hospital and transfused on account of her grave anæmia. A hæmolytic crisis followed the transfusion and she was not improved. Another spontaneous attack occurred a week before her admission to Guy's Hospital. In addition she was then three months' pregnant.

She had a severe anæmia, red cells 1,480,000 per c.mm., hæmoglobin 27 per cent., colour-index 0·9, white cells 4600, platelets 120,000. The differential white count, and the clotting and bleeding times were normal. The mean diameter of the red cells was 7·8 microns. Van den Bergh's reaction was only faintly positive. The resistance of the red cells to hypotonic saline was normal at the first examination (0·45/0·35), but two and a half months later it was diminished (0·55/0·45). Wassermann's reaction was negative and the blood did not hæmolyse on exposure to cold. Physical examination was negative except for anæmia and a spleen two fingers below the costal margin. There were no alimentary symptoms and the test-meal was normal. The urine was chemically and microscopically normal and contained no iron pigment. X rays, cystoscopy, and renal function tests revealed no disease of the kidney. She aborted nine weeks after admission with slight clinical improvement.

The course of the anæmia during the three months she was in hospital is shown in Fig. 1. Massive doses of iron and liver had no effect. The reticulocyte count was always high, but in spite of a reticulocytosis more than ten times the normal, the red count did not rise. Blood formation was much accelerated and the persistence of the anæmia can only be explained by persistent excessive hæmolysis. Now, seven months later, there have been no more acute hæmolytic crises and the blood count is: red cells, 2,570,000 per c.mm.; hæmoglobin, 50 per cent.; colour-index, 0.9; white cells, 3600; reticulocytes, 8 per cent. Her Price-Jones curve, which showed a high normal red cell diameter, is contrasted in Fig. 2 with an acholuric jaundice curve published by Hampson and Warner.

The disease is rare, and only two cases have been admitted to Guy's Hospital during the last ten years. P. N. Panton and co-workers described three cases, in addition to two closely related non-syphilitic paroxysmal hæmoglobinurias, in a review of a series of grave anæmias which included 117 pernicious anæmias. Isolated cases have been described by many authors and small groups of cases by Adler, Bergmark, and Micheli (1930). The mixed series of cases of non-Addisonian hæmolytic anæmia reported by L. S. P. Davidson and by G. W. Goodhart also include examples. The disease appears at all ages, most often in young adults. The anæmia is often severe, the colour-index variable but usually about unity. The most striking feature is the great and persistent increase of reticulocytes. Nucleated red cells including megaloblasts are often seen. In perhaps half the cases there are periodic exacerbations of hæmolysis, productive of hæmoglobinuria and jaundice. At these times there may be leucocytosis and occasional myelocytes, but in the chronic phase white cells are rather diminished in numbers. The spleen may or may not be enlarged. Nutrition and digestion are normal. The disease may prove fatal after a course of several years. Post mortem "the characteristic changes of pernicious anæmia are found."[53] Micheli (1931) has separated under the title of hæmosiderinuria a group of cases in which the liver and spleen are not enlarged, iron pigment is present in the urine, and hæmosiderosis is concentrated in the kidney. Detailed classification of

this type is premature when knowledge is so imperfect, and Panton showed that iron pigmentation might be chiefly localised in the skin.

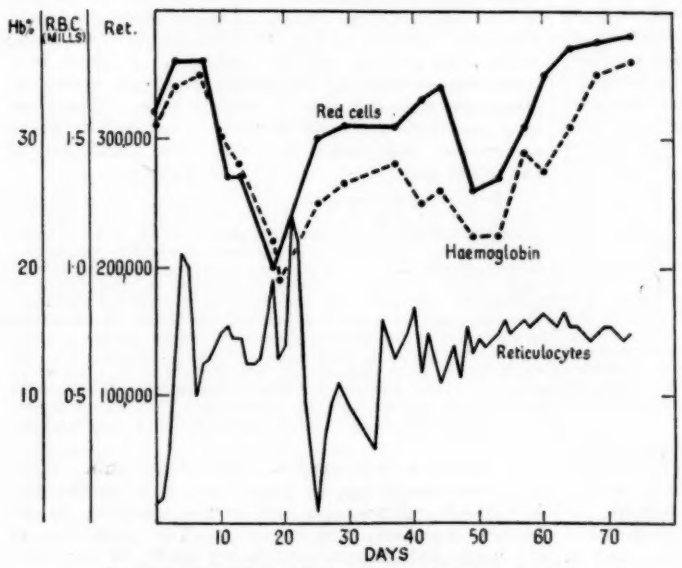
These cases differ from congenital acholuric jaundice in the absence of a family history and in the size and shape of their red cells. In acholuric jaundice the red cells are small and spherical, while in acquired hæmolytic anæmia they are usually a little larger than normal and not spherical (cf. Fig. 2). The fragility may be impaired in both diseases, though more constantly in acholuric jaundice. In pathology these anæmias are obviously quite different from pernicious anæmia, being the result of increased blood destruction and not of diminished formation. They show some features in common with the hæmolytic crises of late syphilis and malaria, but differ in their persistent hæmolysis. A similar type of anæmia sometimes occurs in aleukæmic leukæmia, and more seldom in Hodgkin's disease. These comparisons suggest the possibility of morbid changes in the body fluids or the reticulo-endothelial system. When the spleen is enlarged, benefit may follow its removal but cannot be promised with the same confidence as in acholuric jaundice. Medical treatment is ineffective and transfusion often harmful.

Anæmia in Childhood.

Before discussing the acute hæmolytic anæmias, I must make a short digression into the anæmias of infancy and childhood, and here, as my own experience is small, I will follow closely Nobécourt's description. The anæmias of infancy and childhood are still imperfectly understood. This is due partly to the difficulty of investigating these little patients, but even more to the lability of the erythron at this time of life. Leaving on one side anæmias due to diseases of the liver and spleen, of the white cells, and of the platelets—and in practice it is not always easy to differentiate them from diseases of the erythron itself—the pediatrician is accustomed to divide the anæmias of infancy and childhood into the mild or *simple*, and the severe or grave. The *simple*, which are usually of a chlorotic type, do not concern us now.

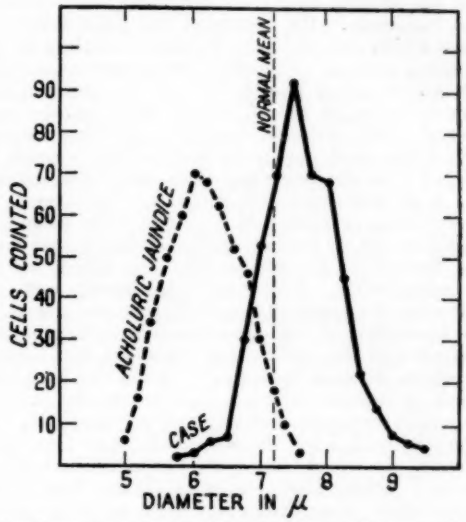
The grave anæmias of childhood sometimes date from an acute infection such as measles but just as often there is no apparent cause. They fall into two groups, the aplastic and the plastic; intermediate forms of a hypoplastic type also seem to occur. In the *aplastic anæmia* morphological changes in the red cells are absent, there is little anisocytosis or polychromasia, there are no nucleated red cells, and the white cells are diminished in numbers. The disease undoubtedly corresponds with the aplastic anæmia of later life. Death may occur from the complete failure of the marrow, or, more often than in adults, there is a gradual resumption of function. This aplastic anæmia will not be referred to again. In the *plastic anæmia* of childhood there is much anisocytosis and polychromasia, normoblasts and megaloblasts circulate in the peripheral blood the white cells are much increased in numbers, and large numbers of myelocytes may be present. The spleen may be enlarged and more rarely lymph glands are palpable. This type of anæmia is most common in sucklings, and of 124 cases collected by Hallez (quoted by Nobécourt) 120 were less than 2 years of age and the majority from 6 to 20 months. It is this type of anæmia occurring in infants which is often known as the pseudo-leukæmia of von Jaksch, but von Jaksch's syndrome is at present in the melting pot, and I shall therefore make no further reference to anæmia in infancy.

FIG. 1.



Persistent reticulocytosis in chronic hæmolytic anæmia.

FIG. 2.



Price-Jones curves in chronic acquired hæmolytic anæmia and in acholuric jaundice.

Acute Hæmolytic Anæmia.

In discussing these plastic anæmias Nobécourt refers to several cases of the same type he has encountered in later childhood and in adults. From a study of the literature and of a series of cases observed by R. J. L. O'Donoghue and myself at Guy's Hospital, I have felt that it will be profitable to collect them together

and discuss them in some detail. Our subject opens in the year 1900, when Leube reported a case of rapidly fatal anæmia in a boy aged 10, whose peripheral blood showed anæmia of high colour-index with normoblasts and megaloblasts and only moderate increase in white cells, while the morbid changes after death were those of acute leukæmia. He suggested the possibility of a disease which combined the features of leukæmia and pernicious anæmia, and gave it the name leukanæmia. With accessions of knowledge and the reorientation of hæmatology in recent years, much of the controversy which followed Leube's paper has become meaningless, and the term leukanæmia should be banished from our writings. Cases diagnosed leukanæmia were leukæmia with secondary disturbance of the erythron, or pernicious anæmia with secondary myeloid effects, or perhaps most commonly they were acute hæmolytic anæmia of the type which we are now considering. The important result was the publication of a number of cases of grave anæmia which were characterised by simultaneous and profound disturbance of the erythroblastic and myeloid tissues, and which differed biologically from the incurable diseases pernicious anæmia and leukæmia in that they might recover completely and permanently.

The thesis I wish to present is that the cases variously described as acute hæmolytic anæmia (Lederer), acute febrile anæmia (Brill, Benhamou, Moschcowitz), acute leukæmia with recovery, acute pernicious anæmia with recovery, many of the so-called septic or non-Addisonian hæmolytic anæmias, and many of the plastic anæmias of childhood, should be regarded as examples of one and the same disease or morbid process. I shall also suggest that the acute hæmolytic anæmia of pregnancy is the same disease occurring with special frequency in the pregnant woman, and I shall show that in clinical features and hæmatology it is identical, differing only in its resistance to treatment while the fœtus is in utero. The disease may vary greatly in acuteness and in the emphasis of individual symptoms, but in clinical course, blood picture, pathology, and treatment, the cases form a coherent group, in which the differences shade imperceptibly from one case to another. Parkes Weber has aptly termed them acute anæmic breakdowns, and it will be helpful to future research if we discuss their natural history and pathology in an objective fashion. The disease is rare and we have had only six cases during the last ten years at Guy's Hospital, of which the following is a typical example:

A man, aged 42, was admitted to Guy's Hospital with jaundice and anæmia in June, 1922. His illness had begun suddenly with a slight rigor five weeks before. His previous health had been good except for malaria when he was soldiering in India. A paternal uncle was said to have died of jaundice, and of his ten children, five had died young, two of jaundice. He had not been in contact with any chemical or known poison. The temperature was raised to 100° for two days after admission and thereafter was normal. He had general yellow jaundice and the spleen was just palpable. The fæces were normally pigmented, the urine contained urobilin, no bile. The test-meal was normal. The indirect van den Bergh reaction was positive. Without any treatment he made a rapid improvement as shown in Table I. Nine years later he had remained perfectly well, and physical examination was negative. The blood count and the fragility of the red cells were normal and the van den Bergh reaction was negative.

The disease affects males and females equally. It occurs at all ages but is more common in the first and second decades. The onset is often abrupt with fever, influenzoid symptoms, sore-throat, or biliousness. Hæmoglobinuria has been described but is unusual,[38] and there is a variable degree of jaundice. The pace of the disease varies, and it may be only a few days or on the other hand several weeks before the anæmia attracts attention. By this time the red cells have fallen below two million and may be only a few hundred thousand. The colour-index is about unity. The diameter of the red cells is sometimes diminished, sometimes increased. There is a high reticulocytosis, often 30 per cent. or more,

TABLE I.

Date.	Red cells.	White cells.	Hb. %.	Colour-index.
12/6/22	696,000	—	22	1·6
16/6/22	1,688,000	6,420	36	1·1
19/6/22	2,384,000	—	44	0·9
22/6/22	3,400,000	—	50	0·7
27/6/22	2,856,000	—	58	1·0
30/6/22	3,150,000	—	56	0·9
22/7/31	4,800,000	6,000	89	0·9

and large numbers of megaloblasts and normoblasts may appear. The fragility of the red cells may be normal, or it may be increased, returning to normal when the anæmia is repaired. Van den Bergh's reaction is positive. The white cells are often much increased in number and immature cells may enter the circulation and simulate leukæmia. The platelets are diminished and petechiæ, purpura, or spontaneous hæmorrhages may develop.

Normal resistance to hypotonic saline was found by Christiansen, Fiessinger, Lederer, Opitz, and Weber; low resistance by Holst, 0·52/0·36, Moschcowitz, 0·80/0·19, Benhamou, 0·52/0·40, rising to 0·46/0·38 on recovery.

Weber's patient, aged 11, had 25,000 white cells, of which 71 per cent. were lymphocytes, 17 per cent. normoblasts, and 5 per cent. megaloblasts. Lederer's patient, aged 24, had 44,000 white cells, of which 1 per cent. were myelocytes, 8 per cent. normoblasts, and 1 per cent. megaloblasts. Holsti's patient, aged 37, had 45,000 white cells, of which 79·7 per cent. were myelocytes. Teeter's patient, aged 6, had 133,000 white cells with 11 per cent. myelocytes, 6 per cent. myeloblasts, and many normoblasts and megaloblasts. All these patients made a permanent recovery.

The clinical picture is that of a severe systemic infection. The temperature ranges from 99° to 105°. The face is swollen and the limbs often œdematous. Red patches like Osler's nodes sometimes develop on the hands, and subcutaneous blebs on the limbs and elsewhere. The colour is pale, café-au-lait, lemon-yellow or jaundiced, but as a rule the patient is more anæmic than icteric. The test-meal is normal. The liver, spleen, and less often the glands in the neck, axilla, and groins, may be enlarged. If there is a hæmorrhagic tendency, retinal hæmorrhages, epistaxis, gingivitis, hæmatemesis, or melæna occur. The urine may contain a trace of albumin, a few red or white corpuscles, and much urobilin. The condition of the heart may cause difficulty in diagnosis:—

"As the anæmia progresses the first sound at the impulse becomes short and abrupt, and if in addition it is slightly reduplicated the simulation of mitral stenosis is very close. We have not detected in such cases a definite thrill, but there is invariably a soft systolic murmur after the abrupt first sound. When the degree of anæmia is very profound, a diastolic murmur may also become evident at the base, with its maximum usually just to the left of the sternum in the second intercostal space. When in addition there are fever, purpura, and enlargement of the spleen, the resemblance to a progressive endocarditis is so close as to give rise to the greatest difficulty in diagnosis. It is equally remarkable when there is improvement in the anæmia, how completely these cardiac signs alter and return to the normal."[39]

In addition there may be a pericardial rub. With all these symptoms, so suggestive of a septicæmia, the blood culture and the serum reactions to all known organisms are negative. The mortality of the untreated disease is probably about 50 per cent. The fever lasts from a few days to several months

and there is no hard-and-fast line between the acute and subacute cases. As long as the temperature is raised, hæmolysis seems to be active, for anæmia and reticulocytosis persist, but if the patient survives the crisis, recovery is spontaneous, complete, and permanent. In cases coming to autopsy there are widespread fatty degeneration and iron pigmentation of the viscera. Hæmorrhages may be present in the brain and elsewhere. The spleen is large, and in the acute cases dark and red and soft, its sinuses engorged with blood. The bone-marrow is hyperplastic, maroon coloured or like red-currant jelly, and it contains many megaloblasts and usually myelocytes also. In Moschcowitz's case there were hyaline thrombi in many organs, composed of agglutinated red cells, and in other cases sterile infarcts of the spleen and aseptic necroses of the lymph glands have been found. Bacteriological examination is negative except for a few cases explained by contamination.

In the treatment of acute hæmolytic anæmia iron, arsenic, and removal of septic foci do no good. Liver has been introduced too recently for its value to be assessed and it has been used only in cases which might well have recovered by their own forces. The most striking feature of the treatment of acute hæmolytic anæmia is the dramatic effect of transfusion, often observed in patients who seemed moribund. The temperature falls and a rapid recovery sets in. More than one transfusion may be necessary to arrest the hæmolytic process, but in cases properly treated by transfusion, death is a rare event. This specific action of transfusion is observed in no other blood disease except the hæmolytic anæmia of pregnancy, though there is a parallel in the cure of icterus gravis neonatorum by serum. With this observation I shall leave theoretical consideration of acute hæmolytic anæmia till I have discussed the hæmolytic anæmia of pregnancy.

(To be concluded.)

DISSEMINATED SCLEROSIS.

CLINICAL AND SEROLOGICAL OBSERVATIONS DURING EXPERIMENTAL VACCINE TREATMENT.

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IN March, 1930, one of us [1] published a preliminary article describing some results of treatment in disseminated sclerosis by means of an autogenous vaccine prepared from the cerebro-spinal fluid.

The bacteriological basis on which this treatment was originally founded was the presence of a characteristic ultra-microscopic spherula, described in the same number of THE LANCET by Miss K. Chevassut [2] as occurring in the cerebro-spinal fluid of patients suffering from disseminated sclerosis when this fluid was incubated with Hartley's broth and human blood-serum. According to Miss Chevassut, this characteristic spherula was observed by her in 176 out of 189 cases (i.e., a percentage of 93 per cent.), whilst in a control series of 269 cases, comprising normal persons as well as patients suffering from other organic nervous maladies, she recorded uniformly negative results. The occurrence of a positive colloidal gold curve, similar to that already noted by previous observers, was confirmed. In addition, she described a characteristic acid wave as occurring in cultures of the spherula, claiming that the pH of such cultures underwent a temporary reduction from 7·6 to 7·0, lasting for about five days before returning to the previous level; subsequent to which the alkalinity increased up to about 8.

This bacteriological work has most properly been subjected to critical examination by independent workers. The results are conflicting. Confirmatory observations as to the presence of the spherula in disseminated sclerosis and its absence in control cases were published by Smith and Ransome,[3] of Liverpool, who found the spherula present in 11 out of 12 cases of disseminated sclerosis and absent in control cases; also by von Sarbó,[4] of Budapest, who found the spherula present in over 100 cases. On the other hand, Carmichael,[5] of London, consistently failed to find the spherula in a series of 19 cultures from cases of disseminated sclerosis, although he, like Miss Chevassut, had the advantage of consultation with Mr. J. E. Barnard as regards the necessary ultra-microscopic technique. Carmichael also failed to observe any acid wave in broth cultures of the spherula. His estimations, however, of the pH were made by using a rocking electrode instead of the bubbling electrode used by Chevassut, and cannot therefore be regarded as strictly comparable. Carmichael's observations on the colloidal gold curve were in agreement, broadly speaking, with those of Miss Chevassut and of other observers.

Further critical observations on the bacteriological side of the research have since been forthcoming from various other sources. These are at variance in several respects, not only with Chevassut's but also with Carmichael's work. Thus, for example, Lépine and Mollaret [6] in Paris demonstrated the presence of an ultra-microscopic spherula, not only in 12 cases of disseminated sclerosis but also in six control cases from other organic nervous diseases, and even in Hartley's broth without admixture of cerebro-spinal fluid, and also in the aqueous humour of the rabbit after injection of a drop of human serum. They failed to confirm the occurrence of an acid wave in cultures from the cerebro-spinal fluid in disseminated sclerosis. They came to the conclusion that the ultra-microscopic spherula was probably not a living virus, and nor was it a specific appearance in disseminated sclerosis. Tronconi [7] in Pavia and Hicks and Hocking [8] at Westminster have also demonstrated the presence of a spherula in various degenerative diseases of the central nervous system other than disseminated sclerosis. The observations of one of us (F. D. M. H.) are, in the main, in agreement with these latter observers.

For reasons already set forth,[9 10] we have dissociated ourselves from Miss Chevassut. The research, however, has been continued in our special laboratories at Westminster Hospital Medical School. This present paper of ours is based upon observations on a further series of 101 consecutive cases of disseminated sclerosis examined clinically and serologically within a period of six months from March to September, 1931.

CLASSIFICATION OF CASES.

Our 101 cases, of which 22 were early, 62 moderate, and 17 advanced, have been classified, not according to the duration of their signs and symptoms, but according to the stage of the malady which had been reached when the patient first came under observation.

By this standard, an *early* case is one in which the physical signs, whilst sufficiently definite to establish a positive diagnosis (e.g., an extensor plantar response, pallor of one or both optic discs, nystagmus, absence of one or more abdominal reflexes, &c.), are so slight as not to interfere in any way with the patient's ordinary daily activities. Twenty-two of our cases belonged to this category. Amongst them were included several patients whose first symptoms dated back 14, 13, and 11 years respectively; others had only shown symptoms for five or six months, whilst the average duration of these early cases was four years.

A *moderate* case, according to our classification, is one with well-marked physical signs and symptoms, evident not only to the physician but also to the patient and his friends (e.g., weakness, spasticity or ataxia of the upper or lower limbs, visual impairment, diplopia, increased tendon-jerks, clonus, &c.), but in which the patient is still capable of carrying on his daily occupation and of earning his living. Sixty-two of our present series of 101 cases belonged to this moderate class, and had an average duration of 7·8 years.

An *advanced* case is one in which the patient's physical disabilities are so severe as to remove him from the class of active citizens, so that he is no longer able to carry on his ordinary occupation but has become an invalid, dependent on his family or friends, getting about with support or even confined to a chair. In our present series 17 cases, by the time they came under observation, were in this advanced stage. The duration of their symptoms varied from less than a year in two acute fulminating cases, up to 28 years in the case of longest standing. The average duration of these advanced cases before coming under observation was 9·3 years.

All the foregoing 101 cases were treated by repeated courses of an autogenous "vaccine" prepared from the spherula cultured in the cerebro-spinal fluid. In most cases this was made according to the method detailed by Hicks and Hocking[11] in doses graduated from 1 million to 200 millions or more. In some cases, however, a simpler volumetric method, as described by von Sarbó,[4] was used, with a weekly dosage ascending from 1 to 10 c.cm. The ordinary duration of a vaccine course was 12 weeks. Before starting a fresh course careful observations, clinical and serological, were carried out in every case.

It should be emphasised that whenever the term "actively growing" or "positive" culture is made in the present paper, it is meant that such cultures show a progressive increase in the number of observable spherules and granules by dark-ground illumination, and not that these particles necessarily constitute either a virus or a living organism.

In view of our uncertainty as to whether the spherula is a virus or merely a biochemical precipitate, we frankly admit that the accuracy of the word "vaccine" is open to criticism. For convenience, however, we have preferred to retain the term for the present.

SEROLOGICAL OBSERVATIONS.

Before detailing the results of our serological investigations, we think it desirable to define the appearances which in our opinion constitute a "positive" culture, as contrasted with one or other of the filtrable contaminants for which it might be mistaken.

Cultural Observations.—One of us (F. D. M. H.), in conjunction with Braxton Hicks,[8] has already drawn attention to the fact that for the satisfactory demonstration of the spherula, the necessary cultural conditions are less strict than those originally described by Chevassut.

Mixtures of normal human serum 3 parts with Hartley's broth 5 parts, after passage through a Berkfeld or Seitz filter, yield a fluid which is optically clear, both to the naked eye and when viewed microscopically by dark-ground illumination. Occasionally a few faintly illuminated granules may be seen showing active Brownian movement, or an unresolved haze; these appearances we regard as filtrable contaminants. On incubating the mixture up to a period of 14 days, no alteration in optical properties occurs, except perhaps that the filter-passing contaminants, if present, may increase in numbers. Such non-specific bodies, all of them feebly illuminated, appear as granules, spheres, or ovoid bodies, the latter being about twice the diameter of the spherule commonly seen in disseminated sclerosis.

When the broth-serum mixture is incubated with cerebro-spinal fluid from a case of disseminated sclerosis a change occurs, sometimes within 24 hours, sometimes only after longer periods—e.g., not until after seven days' incubation. This change consists of a naked-eye opalescence which develops in the incubated tube as opposed to a persistence of clarity in the control tubes. The opalescence becomes more pronounced as incubation continues, but no actual precipitate forms. On microscopical examination with dark-ground illumination, this opalescence is seen to be due to the presence of brighly illuminated spherules of varying sizes up to about 0·25 μ in diameter. The larger spheres reflect light only from their periphery, thus appearing as bright rings each surrounding a central dark space. In the smaller spheres the central dark space is reduced to a mere dot, whilst still smaller particles appear as bright granules only. In addition, a number of more faintly illuminated particles, still smaller, are observed. At this stage of incubation there is no tendency for the particles to aggregate together, and they are actively motile with a characteristic vibratile Brownian movement. When left illuminated on the microscopic stage for long periods—e.g., an hour or more—most of these particles appear to settle down and lose their movement, even when drying of the preparation is prevented by sealing down the cover-slip. A similar but transient slowing or cessation of movement has been described by Guardincerri (in a private communication to us) when cultures are exposed to the action of ether or chloroform vapour. In such circumstances he has noted the return of motility when the effects of the vapour have worn off. So far, we have not been able to reproduce this phenomenon.

As incubation proceeds, both spheres and granules increase in numbers, the former at a greater rate than the latter. It is conceivable, therefore, that the process is one of gradual development from granule into spherule. A tendency to aggregation of particles may now be observed, in which relatively large spherules are seen to which are attached both granules and smaller spherules. This process of aggregation is never a very marked feature of these cultures, it being rare to see a total of more than four or five elements thus aggregated. Large colonies, such as those originally described by Chevassut, have not been observed by us, whether in serum-broth cultures or by the agar-slip method devised by Welch.[12]

Finding ourselves unable to corroborate the presence of these large colonies, both von Sarbó and ourselves have accordingly discarded the slip method of examination, and now rely upon the appearances developing in liquid cultures.

Whilst aggregation occurs as above described, no coalescence of particles to form large single bodies or droplets has been noted by us. Each particle appears to attain its maximum size (approximately 0·25 μ to 0·3 μ), and then remains discrete. It is possible that this aggregation or agglutination phenomenon is due to adsorption of protein on the surface of the developing spherules, thus forming around them a skin of precipitated albuminous material differing in composition from the main bulk of the particle. Such a physical barrier would effectively prevent the running together of liquid particles to form large droplets.

If incubation be continued for a further period—viz., up to 14 days—the only further change observed is an increase in the number of spheres and granules.

With regard to the filamentous structures described by Chevassut, these are inconstant and late in appearance. When they occur the filaments vary in length from approximately 0·1 μ to 2 μ, and are excessively fine and tenuous. They are best seen either in "strongly positive" cultures, or in those which are relatively old—i.e., 7 to 14 days. The filaments occur in conjunction both with spherules and granules. They are never observed as simple unattached entities. When present, they serve to link together a varying number from two to six spheres or granules. The commonest arrangement is that of a central sphere to which are attached one or more filaments of varying length with

granules or small spheres at their free ends. Occasionally filaments are seen crossing each other transversely, with small refractile granules at the free extremities of each filament.

Still another appearance is not infrequently observed, and more often in disseminated sclerosis than in other cases of organic disease—viz., a straight, beaded rod-like form about 4 μ long and 0·15 μ in diameter. This rod participates in the general Brownian movement but has no motility of its own.

Ovoid bodies, or appearances suggestive of "budding," have never been observed by us in uncontaminated cultures.

In all cases illuminated by transmitted light the microscopical field is completely blank. Dark-ground illumination is essential to yield the foregoing appearances. No characteristic staining reactions have yet been discovered. Attempts to dissolve out the spheres and granules by fat solvents have failed, but this failure may possibly be associated with the presence of the adsorbed protein skin around the particles as above suggested.

In our experience the foregoing ultra-microscopical appearances are not produced by incubation of normal cerebro-spinal fluids. They occur with great frequency in disseminated sclerosis, but they are not pathognomonic of the disease, since they are also seen in cultures from other organic nervous diseases, as seen in the following list:—

Tabes	7 cases.
Tabo-paralysis	6 „ out of 7.
Cerebral tumour	3 „
Cerebral thrombosis	2 „
Cerebral abscess	1 case.
Subacute combined degeneration	3 cases.
Amyotrophic lateral sclerosis	1 case.
Uræmia	1 „ out of 3.
Tuberculous meningitis	2 cases.
Parkinson's disease	1 case out of 2.
Amentia	1 „
Total	28

On the other hand, negative cultures were obtained in the following:—

Normal individuals	4 cases.
Hysteria	5 „
Vertebral scoliosis	1 case.
Tabo-paralysis	1 „ out of 7.
Uræmia	2 cases out of 3.
Parkinson's disease	1 case out of 2.
Total	14

We would also draw attention to the fact that identical spheres and granules can be seen in many other pathological serous fluids—e.g., serous pleural fluid, serous peritoneal fluid, or serum from chancres—and also in serum-broth cultures that have become contaminated with pathological micro-organisms. If, however, the spheres and granules are removed from such serous fluids by filtration, in only very few instances will they reappear on subsequent incubation. Cases in which reappearance does occur are generally those which had originally contained pus, together with their filtrable enzymes which might subsequently effect a breakdown of serum constituents. "Positive" cultures from cases of disseminated sclerosis can be rendered optically clear, naked-eye and microscopically, by filtration, but re-incubation will constantly reproduce the initial characteristic appearances. This process of filtration and re-incubation can be repeated several times in succession, although the development of granules, &c., tends to slow up after continuous repetition. Optically clear fluid obtained by filtration from a "positive" culture will also reproduce a characteristic appearance when subcultured into fresh broth-serum mixture.

SEROLOGICAL OBSERVATIONS AFTER AUTOGENOUS VACCINE TREATMENT.

A. *Cultural Results.*—Bearing in mind the above criteria of a "positive" culture, we have observed that 10 out of our present series of 101 cases of disseminated sclerosis have become negative during courses of vaccine treatment, whilst 26 cases after showing initially a strongly positive result have become faintly positive. By "faintly positive" we mean either a smaller number of spheres and granules or their delayed appearance—i.e., not until five or seven days after starting the culture. With one exception, all the cases which have become culturally negative after treatment have also shown marked clinical improvement. In four cases, cultures after being positive on several successive occasions have gradually become negative, then for a short while positive again, and finally negative. Here again these findings are associated with clinical improvement.

B. *Globulin and Albumin Content.*—The globulin reaction in the cerebro-spinal fluid has been determined by the usual Nonne-Apelt ring precipitation test. In 72 out of our 101 cases a positive result was obtained at the outset, and in 24 of these the reaction after treatment became negative or only very faintly positive. This diminution in globulin reaction was not always strictly parallel to the clinical improvement, since many of our cases which showed the greatest degree of clinical improvement still yielded a definite globulin reaction. The total albumin content was also systematically observed and in all cases was within normal limits, up to 0·02 per cent.

C. *Colloidal Gold Curve.*—There has been a considerable controversy on the subject of the colloidal gold curve in the cerebro-spinal fluid in disseminated sclerosis, chiefly owing to the difficulty experienced in securing a standardised gold-sol preparation. In our series of cases the colloidal gold solution was made up by formaldehyde reduction in an alkaline medium (potassium bicarbonate). It was finally tested for sensitivity by saline solution, and also by the method of Black, Rosenberg, and McBride.[13] Solutions made up independently in two different laboratories, and tested on the same sample of cerebro-spinal fluid, have always yielded identical results. In agreement with Chevassut these show that the degree of precipitation in disseminated sclerosis is greater than that usually described as typical of this condition, complete precipitation in a number of tubes being by no means uncommon. A fairly typical curve when the patient first comes under observation is 334541000. After a course of vaccine treatment it is not uncommon for the gold curve to improve in type. Only rarely (in 8 out of 101 cases) has it become negative. Definite improvement was seen in 35 cases, 11 became more intense, and the remaining 47 were practically unchanged.

D. *Blood Counts.*—In view of a paper published by Goodall and Slater[14] suggesting a relationship between disseminated sclerosis and subacute combined degeneration of the spinal cord, all our patients in this present series had routine blood examinations carried out, including estimation of hæmoglobin, enumeration of red blood corpuscles, also a total and differential leucocyte count. In none of our cases was there any degree of anæmia present, or any deviation from the normal total and relative proportions of white cells.

E. *Liver Function Tests.*—In her original article, Chevassut described certain tests the results of which suggested impairment of liver function in patients suffering from disseminated sclerosis. These tests have been repeated by us. In only one of our 101 cases was the glycuronic acid test negative after the ingestion of 10 gr. of aspirin, and in only five cases was there an excess of indican in the urine. In a

number of cases outside the present series lævulose-tolerance tests were also performed. The results were found to be inconstant; in some there was evidence of partial impairment of liver function evidenced by a diminished lævulose tolerance, whilst in the majority of cases no abnormality could be detected.

F. *Effects of Cultures upon Spinal Cord in Vitro.*—Recalling certain animal and biochemical experiments previously recorded by ourselves,[11] the possibility was suggested that a degenerative action upon myelinated nerve-fibres might conceivably be obtained in vitro when cultures were incubated with slabs of spinal cord. For this purpose the spinal cord of a rabbit was aseptically removed, cut into discs approximately ¼ in. thick, and incubated in an actively growing culture from a case of disseminated sclerosis. At the same time, similar control slabs were incubated in a simple broth-serum mixture. The slabs of cord thus treated were removed every 48 hours, up to 28 days, and treated by Marchi's method to demonstrate myelin degeneration. The results were entirely negative.

CLINICAL OBSERVATIONS OF AUTOGENOUS VACCINE TREATMENT IN 101 CONSECUTIVE CASES OF DISSEMINATED SCLEROSIS.

It should be noted that the period of time during which this series of cases was under observation is not limited to that particular six months. The average duration of clinical and serological observation in our 101 cases dated back 12·7 months, whilst many of them were under observation for varying periods up to three years.

A. In *early cases.*—As might be expected, the results were more encouraging in the early group. Thus out of 22 early cases, 14, or nearly two-thirds, showed definite clinical improvement, whilst in another one-third or more—viz., 8 cases—the clinical signs and symptoms ceased to advance. Only two were exceptions: one patient of this early group improved clinically for several months, after which he relapsed to his previous state; another patient, after improving for a year, had a severe relapse, became steadily worse, and has now become an advanced case.

It may be convenient at this point to record the further progress of the four illustrative cases described in our preliminary communication[1] of March, 1930.

The first two cases, a girl, now aged 19, and a woman, now aged 37, have remained in good health and free from clinical symptoms since two years ago. No further examination of the cerebro-spinal fluid has been obtained.

The third case, a young woman, now aged 32, in whom the physical signs comprised pallor of one optic disc, nystagmus, and a left-sided extensor response, has remained stationary, save for slight difficulty in reading, apparently due to a para-central scotoma in both eyes as determined by Mr. A. F. MacCallan. Repeated courses of experimental autogenous vaccines were persevered with, nine series in all. When re-examined in June, 1931, seven years after the onset of the original symptoms, there was no advance in the physical signs, which included pallor of the left optic disc, nystagmus, and an indefinite left-sided plantar response. The cerebro-spinal fluid, however, still yielded positive cultures of the spherula, together with a gold curve of 5553210000. One cannot, therefore, regard this case as finally arrested; accordingly we are now supplementing the vaccine treatment by arsenic.

The fourth patient, a young man, now aged 25, is included in our present series. In this case the symptoms dated back to the age of 20, including optic atrophy, spasticity and ataxia of the lower limbs, bilateral ankle-clonus, extensor plantar responses, and absent abdominal reflexes. Before we saw him, no improvement had been attained in spite of repeated assiduous courses of neosalvarsan. Accordingly he volunteered for experimental autogenous vaccine treatment. After two courses of vaccines he rapidly improved, and for a time became able to walk and dance. The ankle-clonus cleared up, but the plantar reflexes remained extensor in type. The reactions in the cerebro-spinal fluid at that time became completely negative. This improvement was maintained for a year until August, 1930. Ataxia of the lower limbs then gradually reappeared, the gold curve, previously negative, was now 2232210000, whilst cultures of the spherula again became positive. Further series of autogenous vaccines were given, supplemented by arsenical treatment. Nevertheless the gold curve increased in intensity to 5554421000, whilst cultures of the spherula remained positive. He remained much the same clinically until April, 1931, when the unsteadiness of the legs increased and ankle-clonus reappeared. The gold curve was now 4434200000 with positive cultures of the spherula. No clinical improvement has since occurred, and it is evident that this patient has failed to respond satisfactorily to treatment.

Bearing in mind the well-known tendency of this disease to undergo spontaneous remissions, it would, of course, be unwise to claim that the improvement or arrest of symptoms in so many of the foregoing early cases was due entirely to the treatment. Nevertheless, the proportion of favourable results seems too high for a mere coincidence, especially when we remember that prior to treatment all of them had been slowly progressive. At any rate, it is evident that the earlier cases come under treatment, the more favourable are the results likely to be.

B. In *moderate cases.*—This group comprised 62 patients, of whom 25 improved clinically and another 26 ceased to advance, whilst 11, or about one-fifth, continued to deteriorate. The cases of longest standing were not necessarily the most obstinate. Thus amongst the 25 which improved were patients in whom the malady had lasted as long as 17, 20, and 25 years, with an average duration of 7·9 years for the 25. The 11 cases which continued to deteriorate had lasted for periods varying from 17 years down to one year, with an average duration of six years.

C. In *advanced cases.*—Here the evidences of widespread degenerations and sclerosis were already well marked and accompanied by severe physical disability. Every neuro-pathologist knows that regeneration of degenerated nerve-cells and fibres within the central nervous system does not occur. We were careful to point out this fact to all our patients, and to explain that the most that could be hoped for, from any form of treatment, might be to arrest the progress of the disease and make the best of those structures which survive. It was left to each patient to decide whether or not he would undertake experimental vaccine treatment. Seventeen such patients, all in the advanced stage, volunteered for the enterprise. Of these, 5 patients, not necessarily those of longest standing or with the greatest physical disability, continued to get worse, whilst in the remaining 12 cases the clinical signs and symptoms remained *in statu quo*, 3 of them finding a definite alleviation of their muscular spasticity.

SUMMARY.

A. *Bacteriological.*—(1) The presence of a spherula in cultures of cerebro-spinal fluid from cases of disseminated sclerosis is confirmed. (2) Similar spherules are observed in cultures of the cerebro-spinal fluid in cases of other organic nervous diseases—e.g., tabes, tabo-paralyses, amyotrophic lateral sclerosis, and tuberculous meningitis. Also in pus-containing serous fluids from the pleura, peritoneum, and from the syphilitic chancre. (3) Spherules are not obtained in uncontaminated cultures of the cerebro-spinal fluid of normal persons. (4) Observations on the blood count and liver function tests in cases of disseminated sclerosis show no deviation from the normal.

B. *Clinical results of treatment by an autogenous vaccine.*—(1) In 22 early cases of disseminated sclerosis all except 2 showed arrest or clinical improvement. (2) In 62 moderate cases one-fifth continued to deteriorate, whilst the remaining four-fifths either ceased to progress or improved. (3) In 17 advanced cases, 5 continued to progress, whilst 12 remained *in statu quo*.

C. *Serological results of treatment by an autogenous vaccine.*—(1) Out of 22 early cases, all of which yielded positive cultures, 3 became culturally negative after treatment, 6 became less marked, whilst 15 remained unchanged. (2) Out of 62 moderate cases, 4 became culturally negative, 17 less marked, 34 remained unchanged, whilst the remaining 7 became more strongly marked. (3) Out of 17 advanced cases, 3 became culturally negative, 3 less marked, 10 remained unchanged, whilst 1 became more marked. (4) The presence of a characteristic colloidal gold curve is confirmed. In 8 cases out of 101 this curve became negative. Definite improvement was seen in 35 cases, 11 cases became more marked, whilst 47 remained unchanged. (5) The globulin reaction was positive in 72 cases at the outset; in 24 of these the reaction became negative or very faintly positive. (6) The albumin content in all cases was within normal limits.

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COMPLEMENT FIXATION IN RIFT VALLEY FEVER.

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Rift Valley fever, the ætiology of which was first determined by Daubney, Hudson, and Garnham (1931), is a virus disease of no little importance to sheep and cattle farmers in British East Africa where it causes a high mortality in young lambs and pregnant ewes. The fact that the disease is transmissible to man, and that in certain respects the clinical symptoms resemble those of dengue, sandfly fever, and yellow fever, renders accurate diagnosis essential.

In addition to man, sheep, goats, and cattle, Findlay and Daubney (1931) found that the virus is pathogenic for monkeys and for many small rodents, more especially mice, which die with acute necrosis of the liver in from 36 to 72 hours. After recovery, it has been shown by Findlay (1932), immune bodies may be detected in the serum of men, monkeys, sheep, and to a less extent of rats, by inoculating mice with virus and serum from recovered cases. In one human case protective antibodies appeared in the serum nine days after the onset of the illness. In the present communication the presence in Rift Valley fever of complement-fixing antibodies is demonstrated.

TECHNIQUE.

The antigen employed was prepared by making a 2 per cent. extract in physiological saline of the liver of rats or mice dying of the disease.

The extract was centrifuged for 10 minutes at 5000 revolutions, and filtered through paper. The resulting suspension was faintly opalescent. In a certain number of cases the suspension was filtered through a Chamberland L_2 candle, but the results obtained were rather less consistent than when the virus was filtered through paper. This may be correlated with the fact that filtration of a liver suspension in physiological saline through an L_2 candle sometimes leads to a reduction in the titre of the virus: 3 m.h.d. (minimum hæmolytic doses) of complement were used in all tests, while the volume of reagents was kept constant at 1 c.cm.; 0·25 c.cm. of a 1 in 10 dilution of inactivated serum, 0·25 c.cm. of physiological saline containing 3 m.h.d. of complement, and 0·25 c.cm. of concentrations of antigen falling from 2 per cent. were incubated together at 37° C. for one hour; 0·25 c.cm. of a 2·5 per cent. suspension of sheep red cells sensitised with 5 m.h.d. of amboceptor were added, and incubation at 37° C. continued. Readings were taken 10 minutes after all the controls had hæmolysed, and again after a further 30 minutes' incubation. Controls consisted of similar series of test sera with saline extracts of normal rat or mouse liver suspension, normal serum with antigen and a known positive serum with antigen, and with normal liver suspension. All the control tubes remained negative except those containing a known positive serum and Rift Valley fever antigen.

In all 64 sera were tested, of which 33 were from human and susceptible animal sources—viz., monkeys (*Macacus rhesus*), sheep, rats, and mice, and 31 from a number of non-susceptible animals and birds which had been inoculated with the virus of Rift Valley fever but had failed to show any symptoms of the disease.

Complement Fixation with Human Sera.

The results with human sera are shown in Table I. The sera were also tested by the ordinary Wassermann reaction but did not fix complement. In addition to sera from human cases of Rift Valley fever, immune sera from a recovered case of yellow fever (I. H.), and from a recovered case of dengue fever (M. P. O'C.) were also included because of the similarity in the clinical symptoms and pathological findings. Neither the yellow fever immune serum nor the dengue immune serum showed any tendency to fix complement in the presence of Rift Valley fever antigen. Syphilitic sera, which were included in order to test for non-specific fixation with liver emulsion likewise gave negative results with the Rift Valley fever antigen.

TABLE I.—*Complement Fixation with Human Sera.*

Serum.	Concentration of antigen.			Controls.
	2%	1%	0·5%	
T. D. (Rift Valley fever)	+	+	−	−
C. E. H. (,, ,, ,,)	+	+	+	−
A. E. G. (7 days before infection) ..	−	−	−	−
(7 ,, after ,,) ..	±	−	−	−
(14 ,, ,, ,,) ..	+	+	−	−
G. M. F. (No definite infection, but repeated exposures)	+	±	−	−
I. H. (Immune yellow fever) ..	−	−	−	−
M. P. O'C. (Immune dengue)	−	−	−	−
Normal human serum A	−	−	−	−
,, ,, ,, B	−	−	−	−
Secondary syphilitic A	−	−	−	−
,, ,, B	−	−	−	−

Sera from three human cases of Rift Valley fever were available. T. D. and C. E. H. had both suffered from acute attacks, and had been shown (Findlay, 1932) to have protective antibodies in their sera.

The serum from C. E. H. was obtained six months after infection. A. E. G., although he had received 10 c.cm. of immune serum from C. E. H., four months previously was found when first tested to be devoid of complement-fixing antibodies. A few days after this test had been performed, A. E. G. contracted Rift Valley fever as a result of assisting at the autopsy of a lamb which was suffering from Rift Valley fever. Fourteen days later complement-fixing antibodies were present in the sera. Protective antibodies, capable of neutralising 1000 m.l.d. (minimum lethal doses) of virus, as shown by the action of the serum in protecting mice against infection with the virus, were detected in the serum nine days after infection.

G. M. F. also had an injection of 10 c.cm. of immune serum from C. E. H. When four months later his serum was tested for complement-fixing antibodies it was found to give a positive reaction, although not quite to the same extent as the sera from definite cases. Protective antibodies capable of neutralising 100 m.l.d. of virus were also present. G. M. F. had not suffered from any symptoms attributable to Rift Valley fever although he had performed a number of autopsies on infected animals. It is thus possible to acquire complement-fixing antibodies in the absence of any definite infection.

Table I. shows that fixation is specific for Rift Valley fever and does not occur with normal serum, with sera from syphilitics, nor with serum from recovered cases of dengue and yellow fever. Complement-fixing antibodies remain in the blood for at least six months after infection.

Complement Fixation with the Sera of Susceptible Animals.

In Table II. are shown the effects of complement fixation with the sera of monkeys (*M. rhesus*) recovered from the infection three to five months previously.

TABLE II.—*Complement Fixation with Monkey (M. rhesus) Sera.*

Serum.	Concentration of antigen.			Controls.	Serum.	Concentration of antigen.			Controls.
	2%	1%	0·5%			2%	1%	0·5%	
Monkey 6	+	±	−	−	Monkey 12 (*no C.S.I.*)	±	−	−	−
,, 7	+	±	−	−	Control 1	−	−	−	−
,, 8	+	+	−	−	,, 2	−	−	−	−
,, 9	+	+	−	−	,, 3	−	−	−	−
,, 10	+	+	−	−					

No C.S.I.= No clinical symptoms of infection.

No fixation occurred with the sera of normal monkeys; incidentally two of the monkeys included as normal had recovered from yellow fever 18 months previously. It will be noted that monkey 12, which failed to give any clinical evidence of infection, fixed complement less actively than the others.

Complement-fixation tests with sheep have been limited to two animals, an adult ewe, inoculated with a Berkefeld filtrate from the livers of two mice; and a lamb, inoculated with infected sheep blood which had been preserved for five months at 4° C. The lamb showed only a very temporary rise of temperature and no great constitutional disturbance, but the ewe had more definite symptoms with a rectal temperature of 107·8° F. (Findlay, 1932). The results are shown in Table III.

Three months after infection the sheep still fixed complement but negative results were obtained with the lamb's serum. Protective antibodies had also disappeared from this animal's serum, though the sheep's serum was still able to neutralise 1000 m.l.d. of virus.

TABLE III.—*Complement Fixation with Sheep Sera.*

Serum.	Concentration of antigen.			Controls.
	2%	1%	0·5%	
Sheep (7 days after infection) ..	±	−	−	−
(14 ,, ,, ,,) ..	+	+	−	−
(3 months ,, ,,) ..	+	+	±	−
Lamb (7 days after infection) ..	±	−	−	−
(14 ,, ,, ,,) ..	±	±	−	−
(3 months ,, ,,) ..	−	−	−	−
Sheep I. control	−	−	−	−
Sheep II. ,, ...	−	−	−	−

In Table IV. are shown the results obtained with the sera of rats and mice. In the case of these animals the complement-fixing antibodies disappear from the sera with considerable rapidity, so that while the most recently recovered animals fix complement, after the lapse of two months from the date of infection complement-fixing antibodies are so reduced as to be no longer detectable by the present test. Mice appear to produce only very small quantities of complement-fixing antibodies. This may be correlated with the fact that recovery from infection does not confer any lasting immunity in rats and mice which can be reinfected four to six weeks after their first infection. On the other hand, it has been found impossible to reinfect monkeys even six months after a primary infection.

TABLE IV.—*Complement Fixation with Sera of Rats and Mice.*

Serum.	Concentration of antigen.			Controls.	Serum.	Concentration of antigen.			Controls.
	2%	1%	0·5%			2%	1%	0·5%	
	RATS.					MICE.			
Infected—					Infected—				
2 wks.	+	+	−	−	2 days	−	−	−	−
3 ,,	+	+	−	−	1 wk.	±	−	−	−
3 ,,	+	±	−	−	2 wks.	±	−	−	−
2 mths.	−	−	−	−	6 ,,	−	−	−	−
2 ,,	−	−	−	−	2 mths	−	−	−	−
3 ,,	±	−	−	−	Control—				
4 ,,	−	−	−	−	1	−	−	−	−
Control—					2	−	−	−	−
1	−	−	−	−	3	−	−	−	−
2	−	−	−	−	4	−	−	−	−
3	−	−	−	−	5	−	−	−	−
					6	−	−	−	−

No positive complement fixation was obtained with the sera of rabbits, guinea-pigs, hens, pigeons, and canaries, animals which have been found to be resistant to infection with the virus of Rift Valley fever.

The Use of Dried Virus.—In the foregoing experiments the antigen used was prepared from the livers of freshly killed mice or rats. It is possible, however, to employ an antigen prepared from mouse livers which have been dried over phosphorus pentoxide.

Mouse 898 was killed on Nov. 20th, 1931, with symptoms of Rift Valley fever; its liver was finely minced and placed in a desiccator over phosphorus pentoxide at a temperature of +4° C. Fifty-six days later the dried tissues were found still to contain virus for 0·5 c.cm. of a 1 in 10 dilution in physiological saline inoculated into each of 4 mice killed 3 mice in 5 days and 1 in 7 days, a slight retardation in the usual time required to kill mice. A 1 in 250 saline extract of this dried mouse liver was then prepared and tested in a parallel series with a similarly prepared extract from the fresh liver of a mouse which had died from Rift Valley fever, allowance being made for the water content

of the fresh liver. The results are shown in Table V.; both antigens were tested against human and monkey sera.

TABLE V.—*Complement Fixation with Dried Antigen.*

Serum.	Concentration of antigen.			Controls.
	1%	0·5%	0·25%	
C. E. H. (Rift Valley fever) ..	+	−	−	−
M. P. O'C. (dengue fever) ..	−	−	−	−
Monkey 9	+	+	−	−
„ 11	+	+	−	−
Fresh Mouse Liver.				
C. E. H.	+	+	+	−
M. P. O'C.	−	−	−	−
Monkey 9	+	+	+	−
„ 11	+	+	+	−

The results were therefore rather less satisfactory than with the fresh liver, in conformity with the findings that the dried liver was rather less rich in virus than fresh liver.

Discussion.

Specific complement fixation may thus be obtained with the sera of man and animals who have suffered from Rift Valley fever, using as an antigen the livers of mice and rats suffering from the disease. Complement-fixing antibodies are present in the blood of men and monkeys for at least five to six months after infection, while positive results are also obtained with sheep three months after infection; no fixation was obtained with yellow fever immune serum or dengue immune serum. Complement fixation thus offers a practical method for the diagnosis of Rift Valley fever. Complement-fixing antibodies were definitely detectable in the serum of A. E. G. 14 days after infection, and in the sheep and lamb about the same period. Protective antibodies were present in the case of A. E. G. nine days after the beginning of the illness at which time complement-fixing antibodies could not be detected. Protective antibodies were also present in the sera of the sheep and lamb seven to nine days after infection. Although further evidence is required on this point, it seems likely that protective antibodies are demonstrable in the serum at a somewhat earlier date than complement-fixing antibodies. Hudson (1931) has recently made similar observations in five cases of yellow fever in man. It may be noted that in the case of men, monkeys, and sheep the degree of complement fixation is in some measure correlated with the intensity of the clinical response to the infection.

Up to the present attempts to obtain flocculation or agglutination of the virus of Rift Valley fever with immune sera have failed, nor has it been possible to obtain evidence of skin sensitivity to the virus in those immune to the disease by the intradermal injection of killed virus.

CONCLUSIONS.

(1) Specific complement fixation occurs with the sera of men, monkeys, sheep, rats, and mice recovered from Rift Valley fever when an antigen of the livers of rats and mice infected with Rift Valley fever is employed. (2) Complement-fixing antibodies are well developed in the serum 14 days after infection, and persist for at least six months. (3) Complement-fixing antibodies may appear in the serum in the absence of any definite illness as a result of repeated exposures to infection. (4) The degree of complement fixation is in the case of men, sheep, and monkeys roughly proportional to the severity of the clinical symptoms. (5) Mice and rats produce only small quantities of both complement-fixing antibodies and protective antibodies. (6) Dried liver as an antigen gives less satisfactory results than fresh livers of infected animals.

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RIFT VALLEY FEVER.

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THE object of this note is to supplement the data given by Findlay and Daubney [1] on the susceptibility of various species of animals, more particularly wild rodents, to inoculation with the virus of Rift Valley fever, and to refer briefly to certain suggestions that were made in the course of the discussion [2] on Dr. Findlay's paper read before the Royal Society of Tropical Medicine and Hygiene.

As stated in our first paper [3] on the disease, the virus was considered to be closely related to the viruses of yellow fever and dengue, and the primary object in taking the virus to England was to ascertain whether any cross-immunity existed between these three viruses. The recent investigations of Schueffner, Dinger, and Snijders [4] on the immunological relationship of yellow fever and dengue were prompted by similar considerations. The Dutch workers wondered if the endemicity of dengue might not be the principal cause of the relative freedom of the Dutch East Indies from yellow fever, and we had indulged in a similar speculation with regard to Rift Valley fever and the absence of yellow fever from East Africa. The results of the actual experiments carried out by Dinger and Snijders [5] are hardly conclusive, and will require extension and confirmation, but the general tenor of their findings is that previous infection with yellow fever failed to protect monkeys (*Macacus rhesus*) against a subsequent infection with dengue, whereas a previous dengue infection conferred some degree of protection against a subsequent inoculation with yellow fever virus.

In the experiments arranged at the Wellcome Bureau of Scientific Research one monkey (*M. rhesus*), immune to yellow fever as a result of a previous infection, did not manifest any immunity against the virus of Rift Valley fever, other *rhesus* monkeys previously vaccinated by Mr. E. Hindle, D.Sc., against yellow fever also failed to show any increased resistance to the virus of Rift Valley fever. The converse experiment could not be tried, owing to the restrictions that have been placed upon the use of yellow fever virus in England.

In the same connexion it would be of considerable interest to compare the susceptibility of various species of African and Asiatic monkeys to Rift Valley fever. The only two African monkeys that have so far been inoculated with the virus in Kenya have failed to react, as judged by subinoculations of their blood into susceptible sheep.

POSSIBLE VECTORS.

Rodents.—The demonstration of the high susceptibility of some European rodents at once recalled to

mind the fact that during the original outbreak in the Rift Valley there had been a considerable mortality, which was referred to plague, among wild rats (*Arvicanthis abyssinicus nairobæ* and *Rattus rattus kijabius*) on the affected farms; and, in fact, on the farm where the most serious losses of sheep from Rift Valley fever were recorded rodents died in such numbers that inoculation with plague vaccine was carried out. Later a search of the records of rat examinations at the Medical Research Laboratory, Nairobi, revealed that no cases of plague had been found in rats forwarded from this area of the Rift Valley during the period of the outbreak.

In order that the susceptibility of field rats might be examined, trapping was undertaken in an area from which Rift Valley fever has not been recorded, experienced natives being very kindly lent for the purpose by Messrs. Symes and Roberts, entomologists, at the Medical Research Laboratory.

In all, 80 *Arvicanthis abyssinicus nairobæ* were inoculated with strains of virus from sheep, from white mice, and in some cases from other arvicanthis. Of 57 arvicanthis inoculated with strains of virus from sheep or mice, 19 died within 20 days of the inoculation, average period 11 days, and 12 at least could be considered positive on the basis of naked-eye lesions and histological findings in the liver. The nature of the infection was further confirmed in a number of cases by subinoculations into mice and sheep, positive results being obtained at intervals from the second to twelfth day after inoculation. After one or more passages through arvicanthis the virus appeared to become considerably exalted for this species.

Mastomys coucha panya, which is a much rarer species in the Rift Valley fever area, appears to be less susceptible. Of 35 individuals inoculated with virus, only six succumbed to the infection.

Only three specimens of *Otomys angoniensis elassodon* have been available for inoculation; all died within five days of inoculation, with rather indefinite lesions. Since it is difficult to keep this species in captivity, it is not possible to draw any conclusion from this result.

Six wild *Rattus rattus kijabius* and one *Leggada bella* all survived inoculation with virus.

At the end of October, 1931, when trapping was commenced in the Rift Valley fever area, it was found that numbers of arvicanthis were dying on the farm where the original outbreak had occurred 15 months previously. Some of the rats that were trapped died in the traps before morning, a most unusual occurrence with this species which is quite tolerant of captivity. The livers were faintly mottled and organ smears usually showed no bacteria. Emulsions in oxalate-carbol-glycerin of the livers of 15 of these dead arvicanthis, and of one *Rhabdomys pumilio* which also died in a trap, were inoculated into lambs, mice, and into other arvicanthis obtained from an area free from Rift Valley fever. The results were uniformly negative, and histological examination of the livers did not reveal any specific lesion.

Ruminants.—With regard to the susceptibility of wild African ruminants we have up to the present only been able to inoculate one African buffalo.

This animal, a male of about seven months, which had been in captivity at the laboratory for six months, was inoculated with virus from a kid. He gave a marked temperature reaction with dullness and anorexia, and showed some stiffness of the limbs, recovering by the eleventh day.

Helminths.—Reference might be made to the species of tæniorhynchus that have been collected in the Rift Valley fever area.

Through a clerical error the name of species which was suspected as being a vector of the virus was previously given as *T. brevipalpis* instead of *T. fuscopennatus*. During the last season three species of this group (*Mansonia*) have been collected in the area and efforts are being made to establish transmission with all of them.

Arthropods.—In connexion with our suggestion that the virus is adapted for transmission by an arthropod vector, it may be of interest to relate that it has been proved to survive for a period of seven days in engorged nymphæ of *Rhipicephalus appendiculatus* that had been infected by feeding on a reacting sheep. Twenty-four days later, when the nymphæ had moulted to the adult stage, they failed to transmit the virus on inoculation into a susceptible sheep, nor did the other adults of the same batch transmit when allowed to feed on a susceptible animal.

CLINICAL CHARACTERISTICS.

In a personal communication Mr. R. E. Montgomery has asked us to search the laboratory records and, if possible, to trace the course of the investigations into a disease of young lambs to which he referred in the discussion of Dr. Findlay's recent paper on Rift Valley fever. Although no records of these investigations can be found, the lesions he describes—namely, the presence of discrete hæmorrhagic points in the parenchyma of the organ, leading to the development of necrotic centres as large as a threepenny piece, together with suppurative processes in the umbilical region—are not consistent with a diagnosis of Rift Valley fever.

The protocols of a second series of experiments with a mild febrile disease of cattle to which he also makes reference, had already been consulted before we wrote our original paper. The records, which consist of temperature charts and post-mortem sheets, indicate that he was dealing with an inoculable disease of domesticated ruminants, with an incubation period of from 7 to 14 days, of which the agent did not pass Berkefeld or Chamberland filters in carefully controlled experiments. This disease does not appear to be either Rift Valley fever, three-day sickness, or heartwater.

As stated in our original paper [3] we have been able to obtain a history of earlier outbreaks of Rift Valley fever in lambs and adult sheep, in cattle, and in man. It is possible, and even probable, that Mr. Montgomery, in common with other veterinarians and medical men, saw cases of the disease, but was not favoured with the combination of circumstances which in 1930 enabled us to connect the disease in sheep with the much milder manifestations in bovines and in man.

Attention has also recently been drawn to clinical and pathological similarities between Rift Valley fever and three-day sickness of cattle.

We have already stated elsewhere [5] that there are available valuable records of inoculations of cattle and sheep with the virus of three-day sickness performed by Montgomery, in which it is shown that the incubation period of three-day sickness in cattle is from five to eight days and that the febrile reaction is invariably accompanied by some degree of lameness which may be so severe that the animals are unable to rise for some days. This is in complete agreement with the clinical picture of the disease as it occurs naturally. Moreover, Montgomery was unable to provoke reactions in any of 23 sheep inoculated with blood containing the virus. Bevan [6] obtained mild temperature reactions commencing from six to ten days after inoculation, in three sheep inoculated with the blood of cattle suffering from three-day sickness. No stiffness or lameness was observed and unfortunately no subinoculations were made into cattle to confirm the nature of the reaction. In his account of post-mortem findings in cattle dead of the disease he states that the liver, kidneys, and spleen showed no lesions, whereas our observations show that in fatal cases of Rift Valley fever in cattle, whether naturally contracted or experimentally induced, there is an unmistakably typical lesion of the liver. Further, although some stiffness of the limbs was shown by the infected buffalo mentioned earlier in the text, no lameness or stiffness of the limbs has been detected in any of the affected bovines that have been under observation.

While three-day sickness of cattle in all probability is a member of the same group of virus diseases, there is hardly room for doubt that it is quite distinct from Rift Valley fever.

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CLINICAL AND LABORATORY NOTES

A CASE OF COMBINED DEGENERATION OF THE CORD TREATED WITH MASSIVE DOSAGE OF IRON.

By L. V. Snowman, M.B. Camb., M.R.C.P. Lond.,
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A woman, aged 45, had been suffering from symptoms of pernicious anæmia since April, 1929. She had the typical lemon-yellow pigmentation, weakness, and dyspnœa, with an erythrocyte count of 2,800,000 per c.mm., and hæmoglobin 70 per cent. She recovered after the administration of liver extract, but suffered two relapses owing to her having ceased to take the liver. In September, 1931, her erythrocyte count had again fallen to 2,000,000, and her average pulse-rate while resting was 120, and she had slight œdema of the legs. At no time was there any glossitis.

After six weeks' liver treatment her erythrocyte count reached 3,475,000, with 72 per cent. hæmoglobin and 7800 white cells, and after another six weeks it was 4,350,000 per c.mm., 79 per cent. hæmoglobin, but the average size of the red cells was not increased. However, she did not show a gain of strength commensurate with the improvement in the blood picture, and in November, 1931, profuse slumber sweats broke out over the chest, followed by tingling in the fingers of the right hand and difficulty in walking. Within a fortnight the characteristic glove and stocking anæsthesia and ataxic gait of subacute combined degeneration of the cord were present.

There was sensory loss to light touch and pain extending in the right arm to the elbow and in the left arm to the wrist, and extending on to the trunk on the right upper thorax. There was also sensory loss on the right leg to the calf and on the left leg to the ankle, also loss of vibration sense in both legs. There was intense pain on pressure in the right upper arm. Astereognosis was complete in both hands, and loss of kinæsthetic sense in both arms and legs led to complete incoördination of movements. The knee-jerks were exaggerated on both sides, the plantar reflex was flexor on the left, and ? extensor on the right. The abdominal reflexes were obtained with difficulty. The patient could not walk without holding on for support, and then only with an unsteady, spastic gait. Rombergism was so marked that she collapsed on to the floor on shutting her eyes. The sphincters were not affected. There was some muscular wasting of the arm and leg muscles, but power was fairly good except in the right arm, although the patient had been in bed for the anæmia for three months before the onset of the disease. There were no trophic changes, but a bluish pigmentation of the skin of the lower abdomen was noticed. Cranial nerves were normal, but there was a slight degree of verbal aphasia.

Treatment with intravenous arsenic had to be abandoned owing to intolerance, and substitution of raw liver for the extract effected little change in her condition after a month. At the beginning of February, 1932, she was put on grs. 150 iron (as Blaud's pill) daily,[1] and ½ lb. raw liver twice weekly.

After two weeks sensation had returned in the left arm and in all but the fingers of the right arm. She could write, which ability she had completely lost. Astereognosis and incoördination in the hands disappeared, the pain was relieved, but the cold feeling persisted. The gait was still very unsatisfactory, and Rombergism was present. At the beginning of the fourth week of treatment the patient gained control of her leg movements almost suddenly, and can now walk without support and even toe to heel. Rombergism has disappeared.

[1] See Treatment of Subacute Combined Degeneration of the Cord by Massive Iron Dosage, by W. Sargant, The Lancet, Jan. 30th, p. 230.

The only signs of subacute combined degeneration now persisting are the slumber sweats, some anæsthesia of the terminal phalanges of three digits, and deficient vibration sense in the left leg. Meanwhile the erythrocyte count has fallen to 3,400,000 and the colour-index risen to 1·3; so the liver has been increased to ½ lb. daily.

A CASE OF UNDULANT FEVER

SIMULATING SUBACUTE CHOLECYSTITIS.

By D. S. Fairweather, M.B., M.R.C.P. Edin.,
HON. ASSISTANT PHYSICIAN TO BLACKBURN AND EAST LANCS. ROYAL INFIRMARY.

Cases of undulant fever still continue to attract the attention of increasing numbers of clinicians, and the latest extensive survey [1] of the varied manifestations of the disease suggests that these are protean. In this report by Hardy and his colleagues of 375 cases which occurred in the single State of Iowa, mention is made of the different diagnoses proffered before the actual cause of the conditions was discovered. Among the erroneous diagnoses were typhoid fever, influenza, tuberculosis, cardiovascular conditions, diseases of the genito-urinary system, and abdominal disorders. It is stated that Simpson [1 2] had a record of twelve appendicectomies and two cholecystectomies performed on cases of undulant fever.

The interest of the case under discussion lies in the full and intelligent description which the patient was able to give of her symptoms, and also in the fact that, in the hunt for the cause of the disease, the gall-bladder seemed to be the most likely focus of infection and a surgeon was called in for his opinion on the advisability of operation.

REPORT OF CASE.

The patient was a farmer's wife aged 30 years, who had had two children, the first, three years ago and the second, one year ago. She consulted me at my rooms at the end of January, 1931. Apologetically, she complained that she had a collection of minor ailments, no one of which in itself was enough to make her seek medical aid.

She had contracted a ringworm on the left forearm two or three weeks before Christmas which had healed, but which had recurred on the outbreak of a cold. Associated with the cold, a dry barking cough had developed about New Year's Day and had brought on vomiting. She further complained of anorexia, and of sweats in the morning from 3 to 6 A.M., which made her far too uncomfortable to sleep. She had noticed that on Christmas Day she had "felt off form and unable to eat her plum-pudding." By New Year's Day she was having "shivering fits" after midday dinner and attacks of goose-flesh, which would continue for the rest of the day if she left the fire, though not if she kept busy at her housework. The shivering attacks would last about half an hour, and as they passed off she began to feel hotter.

Her temperature on the first day of examination was 101° F. and her pulse-rate 96. She was accordingly sent to bed, and very soon her cough disappeared, though she developed a sore-throat. The fauces were a little inflamed, though not enough to account for the temperature. She continued to have occasional rigors about 2 to 3 A.M., and the association with cutis anserina and digestive disturbances—such as wind, occasional vomiting, feelings of vague abdominal discomfort, aching pains in the back, along with very definite tenderness and hyperæsthesia

over the gall-bladder and to a lesser extent around McBurney's point—suggested the possibility of a subacute cholecystitis. The opinion of a surgeon was accordingly sought; while unable to give an alternative diagnosis, he thought that, in the absence of acute pain and greater constitutional disturbance, operation was not advisable. In the light of subsequent events, one must assume that the tenderness was due to a mild inflammatory reaction set up by the presence of organisms in the gall-bladder, as this is one of the places in which the organisms flourish.

Further questioning gave very little help, though there had been diarrhœa, about one day a week, without alternating constipation. The motions had been light brown in colour and rather offensive. The heavy sweats had been rather offensive and strong in odour at the beginning of the illness, though not latterly. Before the patient came to bed the tongue had been dirty grey colour and there had been a bad taste in the mouth and foul breath, though at the time of the first examination nothing abnormal was noted. There had been frontal headaches, especially on awakening in the morning, for some weeks previously. On the whole, sleep was not much disturbed, though she had a tendency to sleep lightly and to awaken early in the morning. Menses were normal.

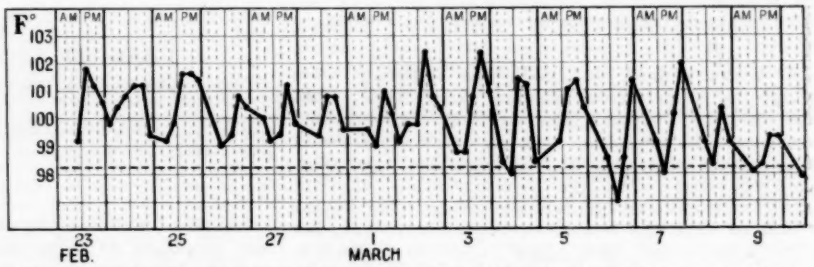
Rash.—About the beginning of February the patient had noticed on the backs of the hands colourless raised-up spots; these lasted two or three days and then disappeared. They did not cause itching.

Beyond an occasional trace of albumin, no abnormalities were detected in the *urine*. There were a few scattered râles in the *chest*, but no other indications of morbidity.

The *spleen* was felt to be soft and was tender to the touch. Although it was definitely enlarged, deliberate examination had to be carried out to detect the enlargement.

Blood.—On Feb. 25th a white blood count showed 8000 cells per c.mm. No differential count was made.

FIG. 1.



Part of four-hourly temperature chart, showing time of day when temperature was highest.

On Feb. 26th a bacteriological report on the blood showed negative agglutination to the enteric group. Agglutination to *Bacillus abortus* Bang was obtained in a titre of 1 in 1280 at 55° C. after 18 hours. The organisms were not isolated from urine or blood, and unfortunately, owing to the difficulties of distance, I was unable to get a further specimen of blood for direct inoculation at the height of the fever.

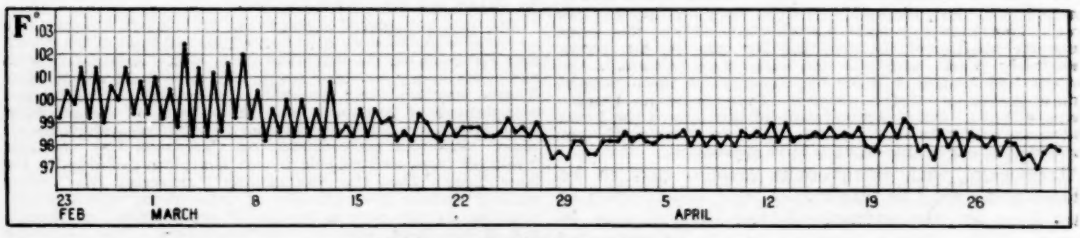
Temperature.—The chief point of interest in the four-hourly temperature chart (Fig. 1) is the daily maximal temperature appearing round about 2 P.M. in the early part of the illness, but at about 6 P.M. as the illness developed. This feature is mentioned in the Ministry of Health Report by Dalrymple-Champneys,[3] who states that in Mediterranean fever "the fever is usually of the remittent type, the rise beginning (according to Hughes) about 11 A.M., attaining its maximum between 2 and 3 P.M. and then falling, reaching normal about 10 P.M. or 11 P.M. or later, the fall being accompanied by profuse perspiration." It will be seen from the chart (Fig. 1) that, generally speaking, in the present case the temperature did not attain its minimum until 6 to 10 A.M. The total duration of the fever (Fig. 2) was probably about 90 days, though an occasional elevation of temperature was noted in the evening after the expiry of that length of time.

The pulse-rate varied between 80 and 100 in the initial stages of the illness.

Course of Illness.—On March 13th the patient complained for the first time of joint pains. The left shoulder began to ache during the day, and this led to difficulty in moving. The pains also affected the elbow. A few red spots appeared on the abdomen, situated about two inches from each other. They were very itchy and not raised up. On March 20th a rash broke out on the foot. The feet and hands itched and burned all through the night. The rash spread up the front of the leg and up both buttocks, and appeared on the back of the right arm and elbow and on the neck below the mandible. It was evident on the soles of the feet, the palms of the hands, and between the fingers. Around the joints it came as big red blotches, while in other places it consisted of reddish spots, about the size of a lentil, more like the rash of rubella than anything else. The spots were slightly raised, and disappeared on pressure.

On March 22nd the rash completely covered the whole body, and on the following day it began to fade from the places first affected. It was almost gone two days later, except for the flexures of the elbows. On March 30th the spleen was just palpable. The patient was now getting up. On April 13th the spleen was neither palpable nor tender.

FIG. 2.



Morning and evening temperature chart.

ORIGIN OF INFECTION.

On inquiring from the farmer (the patient's husband) I learned that there had been an epidemic

of contagious abortion among five of the cattle. The first cow "picked its calf" (to use the farmer's expression) in September, seven weeks before it was due to calve. The calf was dead, but the veterinary surgeon inoculated the cow, which the farmer retained. The second one was delivered about the middle of December, and the calf survived. The cow was milked for a fortnight and then sold. As the patient was in the habit of drinking fairly large quantities of milk, it seems most likely that this cow was the source of infection, as the symptoms were first noted on Christmas Day; this fits in with the incubation period of six to twenty days (Bassett-Smith [4]). The other cows aborted after the onset of the patient's illness. According to Dalrymple-Champneys [5] the majority of actual abortions occur between the fifth and seventh months of pregnancy, though quite often it is not noticed, as the animal's general health is usually quite unaffected. The farmer stated that the condition showed itself in his cows by the occurrence of premature labour with a tendency for the placenta to be retained; this was likely to be followed by a discharge for 14 to 21 days (instead of 7 to 14), offensive and dirty yellowish-looking, associated with a diminution or complete absence of lactation.

SUMMARY.

This case was characterised by: (1) An irregular pyrexia attaining its daily maximum height at about 2 P.M., associated with a pulse-rate not elevated in proportion to the fever and accompanied by rigors. (2) Constitutional disturbance far less severe than would be expected from the height of the fever. (3) Definite tenderness over the gall-bladder area, and to a lesser extent in the right iliac fossa. (4) Definite splenic enlargement and tenderness. (5) Definite history of contagious abortion in cattle on the farm. (6) Report of agglutination in titres up to 1 in 1280 dilution against *B. abortus* Bang at 55° C. (7) Indefinite symptoms and signs referable to the respiratory tract. (8) Delayed appearance of joint pains and, except for a fleeting eruption towards the beginning of the second month of the illness, marked delay in the appearance of a rash.

I wish to express my indebtedness to the director and staff of the Public Health Laboratory, Manchester, for carrying out the agglutination reactions.

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TENDER RIB-CARTILAGE AS A SIGN OF CHOLECYSTITIS.

By D. W. Carmalt-Jones, D.M.Oxf., F.R.C.P. Lond.,

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Cholecystitis is stated by Hurst [1] to be the commonest of all chronic abdominal disorders; it is certainly common in New Zealand, and I recently analysed 100 cases admitted within two years to a hospital of 300 beds.

Some years ago, in examining a case of it my finger-tips accidentally came into abrupt contact with the patient's rib-cartilage bounding the right hypochondrium, which induced a sharp flinch of pain, and on closer examination I found a tender spot upon the eighth right costal cartilage, on its lower edge (not its anterior surface), which could have been found by approaching the patient from behind and hooking one's right-hand fingers round the costal margin.

Since then I have sought for it in every abdomen that I have examined, and I have found it repeatedly in cases of cholecystitis, with or without gall-stones; of course, the great majority of such cases have gall-stones. The sign is sought for with the hand flat on the upper abdomen; the third finger-tip is brought into firm contact with the costal margin, inch by inch along its whole length from without inwards, beginning on the left side, saying nothing and watching the patient's face. Occasionally in cases of gastric ulcer there is a similar but slighter area of tenderness on the left rib margin, but it is inconstant. On the right, in a case of cholecystitis, a single tender spot, indicated by the patient's expression, is found, generally on the eighth rib edge, sometimes a little higher or lower, and just covered by the finger-tip. Occasionally, but by no means always, the skin of the whole eighth dorsal segment on the same side is hyperalgesic to pin-prick. I believe this tender spot to be quite as dependable in the diagnosis of cholecystitis as is McBurney's point in appendicitis.

In some cases of cholecystitis it is continually present, in others it comes and goes, but is usually to be found when any degree of colic is in progress and for some days after, even in persons who do not always show it. It is not invariably present; it is not a sine qua non of cholecystitis; I have failed to find it in a few cases with a positive Graham's test, in which gall-stones were present at operation.

In a series of 20 cases, analysed for another paper, the following results were obtained:—

		Tenderness.	No tenderness.
Previously operated upon for cholecystitis	5	5	—
No operation, symptoms of cholecystitis	4	3	1
Cholecystitis and gall-stones at operation	6	6	—
Cholecystitis, no stones at operation	5	4	1

I do not find that writers on the gall-bladder describe this sign: Graham, Cole, Copher, and Moore [2] mention "a manœuvre first described by J. B. Murphy, a sudden jab of the fingers under the right costal margin just as the patient has completed a deep inspiration . . . will elicit tenderness." This, I take it, is meant to exert pressure on the gall-bladder, but no "sudden jab" is required on the cartilage. Hurst and Stewart [3] state under "differential diagnosis" that "tenderness of the gall-bladder is increased or only present when a deep inspiration carries the gall-bladder sufficiently far below the costal margin to bring it into contact with the fingers," which is probably seeking for Murphy's sign. Walton [4] states that "occasionally there may be slight tenderness in the epigastrium or over the gall-bladder." Griffiths [5] writes of "tenderness below the tip of the ninth right costal cartilage," and Rolleston and McNee [6] write of "tenderness over the upper right quadrant of the abdomen which becomes more localised and more intense at the so-called biliary point below the tip of the ninth costal cartilage. Cutaneous hyperæsthesia may be present in the eighth and ninth dorsal segments." I can, however, find no account of tenderness of the costal margin, of the existence of which I have none the less convinced various sceptical colleagues.

The precise significance, the mechanism of the

tenderness, is a matter upon which one who is only a clinical observer can but speculate. I have to confess that I have had a few cases of apparently typical biliary colic, with a tender cartilage, which came to operation and that then a normal gall-bladder was found.

The gall-bladder is a hollow viscus, and like the other hollow viscera pain arising from it is caused only by some increase of tension within it. It is presumably insensitive to trauma, and hepatic colic is not due to the scratching of a sensitive surface by a gall-stone, but to spasmodic and ineffectual contraction of the viscus, caused, it may be, by an incoördination between the fundus and the sphincter of Oddi through disturbance of the harmonious coöperation of the vagus and sympathetic.

Bain [7] states that the nerve-supply of the gall-bladder consists of the vagus and of fibres from the sympathetic, 6 D to 1 L. Experimentally, slight stimulation of the vagus causes the fundus to contract and the sphincter of Oddi to relax, and this may be assumed to be what occurs when the gall-bladder empties in health. But under strong stimulation of the vagus both fundus and sphincter go into spasm, so that the contraction of the fundus is ineffectual—the condition which induces visceral pain. It may be that biliary colic depends on such stimulus of the vagus. I would suggest that spasm of the sphincter of Oddi, which is believed to be controlled by the sympathetic, induces this tender spot on the body wall, and sometimes hyperalgesia of a whole segment in the area of corresponding somatic innervation. The cases found negative at operation may be due to reflex spasm induced by a focus of irritation elsewhere, or to another cause; spasm of the gall-bladder may possibly be an allergic manifestation.

Graham and his colleagues [8] remark that intestinal allergy is probably rather frequently confused with cholecystitis, but this has received "almost no mention." I believe that some of the negative cases are due to intestinal allergy; this question I am discussing in another paper.

I believe, however, that tenderness of the right costal margin, in the neighbourhood of the eighth costal cartilage, is a valuable sign of disturbed function of the gall-bladder, which is in most cases due to cholecystitis and gall-stones.

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MEDICAL SOCIETIES

ROYAL SOCIETY OF MEDICINE.

COMBINED SECTIONS OF UROLOGY AND OBSTETRICS.

AT a combined meeting of these sections on March 10th, Mr. R. OGIER WARD, the President of the Section of Urology, being in the chair, the subject of discussion was

Frequency of Micturition in Women.

Mr. G. E. NELIGAN said mostly the cause of the frequency was easy to diagnose and the treatment was well established, though in some cases the outlook from the start was hopeless. He enumerated the causes of over-secretion of the kidneys, which might occur: (1) in the later stages of chronic nephritis, when it was due either to acute nephritis of primary character or to hyperpiesis—the history, physical signs, and the presence of albumin and casts in the urine supplied the clue; (2) in the presence of congenital cystic kidneys, where a palpable tumour might be felt and pyelography would aid diagnosis; (3) in diabetes mellitus; (4) in renal calculus, where the history and X rays gave the diagnosis; (5) in renal tuberculosis, pyelocystitis, and pyelonephritis; and (6) in functional polyuria. After mentioning briefly causes arising in the bladder itself, such as calculi, foreign bodies, and carcinoma, and causes of frequency outside the bladder, including pressure of the pregnant uterus, or pelvic tumours, as fibroids or ovarian cysts, Mr. Neligan spoke in more detail on pyelonephritis and functional polyuria.

Pyelocystitis and pyelonephritis.—Usually these cases were readily diagnosed, and readily responded to treatment. It was still not sufficiently recognised that frequent and large doses of alkalis should be given, and that it was not advisable to stop giving potassium citrate as soon as symptoms and temperature subsided. He himself prescribed pot. cit. ʒi. two-hourly until the urine was alkaline, and then gave the drug in sufficient doses to keep the urine alkaline for a fortnight. The difficult cases were the mild ones, symptoms being confined to frequency and pain on micturition. Basal cystitis was usually present and frequently both kidneys were infected. Every patient who had persistent cystitis should have the urine from each kidney cultured, should be examined radiographically and have a pyelogram taken, so as to exclude such complications as calculi. The bladder condition could not be cleared up until the kidneys were well. Patients with pyelocystitis should be impressed with the fact that the three cardinal sins of life were catching cold, drinking too little fluid, and allowing constipation to become established. This applied especially to women, who feared that copious drinking of water would make them fat. Diet also was important; often these women lived on slops and were half-starved.

Functional polyuria.—Patients with functional polyuria usually complained of great frequency during the day, but slept peacefully through the night. Their attention was fixed on their bladders, and hence their social activities were restricted; a railway journey, however short, in a carriage without a lavatory became an agony. Yet they could take a long motor journey without inconvenience if their minds were occupied with a subject of interest. Mr. Neligan felt sure the problem was one of nervous over-secretion of the kidney, because each time these patients urinated they passed a good quantity. Both sexes suffered from it in times of unusual emotional stress, such as during an examination, or when under heavy fire in warfare. In chronic cases the polyuria still continued when the stress was over. In women who had taken sexual risks and were suffering from gonophobic polyuria ceased when they were reassured on this point. Treatment of functional polyuria was difficult and often hopeless. The main requirement was to give an exhaustive

examination in order to be able to assure the patient of the absence of organic disease. Many patients were impressed if it was explained to them that the kidney over-secretion was due to worry.

Mr. VICTOR BONNEY said that frequency might be (1) due to disease or abnormality of the urinary tract or of the genital organs, or of neighbouring structures; or (2) of purely nervous origin. The last group could be further divided into those associated with the excessive production of urine, and those lacking such excessive production. In the first of these groups nothing was wrong with the bladder, the frequency being merely the result of the excessive kidney secretion. In the second group the nervous mechanism was at fault. It could be taken as a rule that frequency which woke the patient at night and compelled evacuation had a physical basis, while if sleep was uninterrupted the case was probably due to functional disturbance. The next main category was of cases in which the frequency was due to vagino-vesical displacement. One of the most common forms of urinary trouble in women was that to which Mr. Comyns Berkeley and himself had drawn attention and which had been termed "stress incontinence" by Mr. Eardley Holland. It occurred in women who had borne children, but was not operative until a number of years after the birth. It was a mistake to attribute it to cystocele. These women voided a sudden jet of urine on coughing or sneezing, or on performing any other sudden act. A true cystocele consisted of a hammocking of the vaginal wall accompanied by a pouch in the base of the bladder, and in excessive degrees it might be necessary for the patient to push the cystocele up with her finger before the bladder would act. Stress incontinence was accompanied by a descent of the lower end of the vagina away from its attachment to the subpubic angle, and this involved also the block of tissue in which the urethra ran and which the speaker had termed the peri-urethral wedge. In the female there was no collection of fibres at the bladder neck which could be called a true sphincter. Instead there was a sphincteric mechanism as he had pointed out in a previous paper. A pessary in these cases was useless. They could be cured by an operation which tautened the sphincteric mechanism. In a few cases ventrofixation of the bladder might be needed. In stress incontinence the escape of urine was quite involuntary, and was not preceded by the urge to micturate, but in what he termed "precipitate micturition" and "urge incontinence" the desire to micturate was so sudden and violent that unless the patient could instantly relieve herself incontinence occurred. The urine in these cases showed no changes pointing to bladder inflammation, and the cystoscope showed no more, in the speaker's experience, than a slight blush at the base of the bladder. The condition was evidently due to a hypersensitisation of sensory nerve-endings or perhaps some vasomotor instability of the vessels in that region. In conclusion, Mr. Bonney spoke of frequency due to urethral caruncolosis. For this condition when intractably recurrent he had obtained relief by lengthening the urethra by an operation, the technique of which he described.

Miss G. M. SANDES said that a comprehensive view of the occurrence of frequency of micturition in women would not be obtained until women had been educated to recognise that frequency was not normal, and should be reported to a doctor. When frequency occurred in patients suffering from venereal diseases it was usually associated with pain; it was very common at the onset of gonorrhœa. Some patients suffered from frequency before discharge occurred. Of hospital gonorrhœa patients she found that 85 per cent.—chiefly girls of 16 to 25 years—had frequency with pain. A young girl might not show diminished frequency until after many weeks in hospital. In older women acute urethritis either cleared up fairly rapidly or became chronic. Many women thought it was the common lot to have a vaginal discharge, and this belief accounted for the fact that many cases of gonorrhœa were not diagnosed until salpingitis supervened. A non-gonorrhœal form of urethritis usually proved very intractable; here frequency was apt to be continuous. On culturing the urine, diphtheroids were grown. Massive doses of alkali and weekly instillation of glycerin was the treatment indicated. The condition was found commonly in dancers and gymnasts. Gumma of the bladder caused frequency, and it was a marked symptom in tabetic women. If it was untreated, overflow incontinence resulted. One group of cases with frequency included those who had had an operation for prolapse of the uterus; the calls could not be said to be due to a nervous condition. Examination often revealed a small pouch beyond the internal meatus, and this contained residual urine.

Mr. DUNCAN M. MORRISON spoke particularly of neurosis of the bladder, and chronic glandular lymphoid cystitis. In cases of neurosis, examination was usually negative, but the patients who were usually very nervous and irritable complained of marked frequency and urgency, with a dull aching pain in the suprapubic region and in either inguinal region. Careful routine examination showed a contracted urethra and bladder neck, so that the capacity of the bladder was reduced. In some cases an indolent submucous ulcer could be seen, when the urethra was treated by argyrol instillations and gradual dilatation, and at a later stage silver nitrate solution of gradually increasing strength. The ulcer should be touched with 10 per cent. silver nitrate. Failing response, radical resection must be done. Chronic granular lymphoid cystitis occasionally occurred in girls who had marked diurnal and nocturnal frequency, urination usually being precipitate, while the terminal tenesmus might last minutes. Bearing-down pains in the perineum might extend to the clitoris. These women were mentally depressed, and many of them thought they had cancer. The organism most often found was *B. coli*. With the cystoscope a diffuse granular injection with discrete, raised pink nodules over the trigone and the bladder neck was usually seen. Argyrol of 2 per cent. strength should be used, increasing to 10 per cent.

Mr. H. P. WINSBURY WHITE said that about 75 per cent. of the women he examined had frequency of micturition, and the cause was generally in the pelvis. The symptom could be caused by trifling inflammations of urethra and cervix uteri. A cervical erosion, with or without a muco-purulent discharge, or small granulomata projecting from the os sufficed to produce polyuria. In quite a number of long-standing cases a chronic infection of the urinary tract with *B. coli* was found. Cystitis might be present, but very little in the urine to account for it. In 12 cases in a series of 215 a urethral stricture was present; 53 per cent. of his cases with cervical conditions showed organisms in the urine.

The CHAIRMAN insisted on the need for routine culture of the urine in these cases. Unless a patient

had pus in the urine she could not be said to have cystitis. In some cases the character of the urine coming down from the kidney was such that it caused frequency by irritating the bladder. In a number of other cases he felt sure there was no irritation of the bladder itself. One could do a good deal for functional cases by encouragement. When these patients attended hospital and their attention was taken off their trouble they were often surprised to find how long they had gone without passing water; if they then passed, say, 18 oz. it could be made clear to them that their bladder capacity was adequate, and that if they ceased to worry their trouble would probably disappear. A group of patients was seen, chiefly among old people, whose bladder was always greatly congested, and who always suffered from frequency, with much pain. In these the vesical capacity was small. It was probably due to a long-past infection and was difficult to treat.

SECTION OF TROPICAL DISEASES AND PARASITOLOGY.

AT a meeting of this section on March 3rd Dr. CLEMENT CHESTERMAN read a paper on the training and employment of

African Natives as Medical Assistants.

He pointed out that Africa, with one-fifth of the land surface of the globe, contained but one-thirteenth of the world's population. On the West Coast there were between 25 and 30 people to the square mile, whereas in Central Africa there were but 10 or 15, although it was certain these areas where the population was the greatest asset could support ten times that number. The difficulty of providing a medical and sanitary service for rural Africa was very great, not only geographically, but on account of superstition and certain native beliefs and customs, and our best efforts were liable to be looked upon as a kind of persecution. The only way to solve the problem and avoid misunderstanding was through coöperation with the people themselves. He quoted the late Sir Gordon Guggisberg's high opinion of the educability of the native and stated that he believed that the so-called arrested development, where it was observable, was probably but a defensive mechanism of the normal youth against an education ill-suited to his adult life and environment. Simple medical education and practice was eminently suited to his needs and capacities, but for the very reason that it was apt to raise the youth high above the general level of culture and public opinion with regard to disease, he was correspondingly tempted to lose his balance. For some generations therefore it was advisable for his own sake and for others that he should serve under supervision and not as a private practitioner.

Dr. Chesterman outlined the present practice in Sierra Leone, the Gold Coast, Nigeria, the Sudan, Uganda, Tanganyika Territory, Nyasaland, French West Africa, and the Belgian Congo, dealing in more detail with efforts in which he had been associated for some years at a mission hospital at Yakusu near Stanleyville in the latter colony. The most important equipment for a training school, he said, was first patients, second patients, and third, more patients. For the teaching staff the equipment was the same, spelt with a "ce." The hospital should be constructed to allow of the easy supervision of all departments by a limited staff, and for that reason a central administration block was preferable to scattered buildings.

In describing the various policies and practices he offered some suggestions for the consideration of those who were responsible for the framing of colonial policy in this matter. An A.D.M.S. medical education should be appointed to unify training, text-books, and examinations, and be responsible for the posting and promotion of medical assistants, who gave better service if the personal touch was maintained. Medical officers interested in such work should be encouraged to believe that in that career they would receive promotion to the teaching posts of the higher institutions and administrative posts. Although higher medical education in Africa with a view to the replacement of European doctors was a proper policy where the general educational level demanded it, yet the formation of a large number of more humble and less expensive native "general practitioners" was the only solution to the rural problem. These could best be trained in rural hospitals, a three years' course sufficing, with practice and theory combined from the start, and subsequently employed in dispensaries depending on their alma mater.

Dr. Chesterman hoped that the new spirit of coöperation between governments and missions might be extended into the realm of rural hygiene, and that many of his fraternity might be stimulated to greater efforts; for all who had faced the problem on the field were agreed that although a little knowledge is a dangerous thing, a lot of ignorance was even more dangerous.

HARLEY MEDICAL SOCIETY.

AT the inaugural meeting of this society held on March 10th, the chair was first taken by Dr. MORELAND MCCREA, who explained the origin of the society as an attempt to foster the scientific spirit among members of the Medical Group of the new London Clinic and Nursing Home. These members, he said, essentially constituted a club and not a company, and they realised that without scientific ideals medicine would soon become a trade. Sir LENTHAL CHEATLE then took the chair.

Mr. LOCKHART MUMMERY read a paper on the

Origin of Tumours.

He said that it had long been evident that any explanation of the origin of tumours must account for their rapidity of growth. He was convinced that the secret of tumour formation must be approached by the study of normal cells. No complete theory had satisfactorily explained why certain cells occasionally behaved abnormally by growing at a faster rate than the normal rate of the tissue to which they belonged. He enumerated the following established facts about tumours as facts which any ætiological theory would have to explain: (1) Tumour cells grew by their own division and not by converting neighbouring cells into tumour cells. (2) The tumour cell was specific to its original character wherever it might be. (3) Tumour cells were species-specific. (4) A very great many different kinds of tumour were to be found in any one species, even tumours growing from the same kind of tissue showed great differences, and two identical tumours were seldom met. (5) Tumours could be produced by a

great many different agents and these agents had no factor in common. (6) Every tumour showed a latent period at the beginning of its development, and this latency did not depend on the age of the subject.

The tumour cell was characterised by an alteration in its behaviour, not in its apparent structure. Probably all cells of the body underwent mitosis at certain times, to replace worn-out cells, but the rate of reproduction varied considerably, and the process had not yet been observed in those tissues where it only occurred at long intervals. There was a beautifully exact adjustment to the requirements of the tissue cells themselves, and the primary controlling factor must be within the cells. Certainly, the behaviour of any cell might be profoundly modified by environmental factors, such as hormones, but the response to these factors was fixed, and determined by its inherent controlling mechanism, inherited from the original germ cells. If a cell or group of cells was found to behave in a radically different manner from that of its neighbours, then some radical change must have taken place in its nucleus

THE GENE THEORY.

Every human cell contained 24 pairs of chromosomes within its nucleus, and each chromosome contained a vast and unknown number of genes. These genes were the controlling factor in the cell's behaviour. The genes in the fertilised germ cell controlled the fate and behaviour of all the daughter cells and ensured that every daughter cell should breed true to the parent. This was equally true of somatic cells, and in the recognition of this fact lay the explanation of tumours. Studies of the germ cell had shown that changes in the nature of the genes could be brought about by extrinsic influences; these mutations were inherited by all daughter cells. Most biologists believed that accidental gene mutations had been very largely responsible for the evolution of new species. If a gene mutation could occur in a germ cell, it could also occur in a somatic cell, with similar results. The suggestion that tumours might be due to mutation in the nucleus of the somatic cell had first been put forward, more than ten years ago, by a German zoologist, Theodor Boveri.

If the gene change produced in the cell was one for excessive reproduction, then a colony of excessively reproducing cells would soon form, and would all continue to breed true, and would increase at the expense of surrounding tissues. This mutation theory explained all the known facts about both plant and animal tumours; it was the missing piece of the jigsaw puzzle. It explained why tumour cells were specific to the tissue in which they arose, and why they grew from their own cells and not by converting neighbouring cells into tumour cells. It also explained why there were so many different carcinogenic agents and such a great variety of tumours, and the latent period in tumour formation. The theory was not susceptible to experimental proof, but relied on logical deductions from observed facts.

There must be other mutations besides that for excessive reproduction, and many diseases besides tumours could probably be explained in this way: some of the leukæmias, for instance. Melanotic and keratotic changes in the skin—e.g., xeroderma pigmentosum—were examples of mutation. Gene mutation could be produced by very many agents, as had been shown by experiment; the agent was assumed to cause an injury to a gene or group of genes. Obvious results of gene mutation would, however, be seen only exceptionally, as they would not be visible for several cell-generations, and adult cells reproduced but slowly. Skin cells were replaced more often than deeper cells, and changes in them were more obvious; therefore these changes were best known in skin epithelium.

The CHAIRMAN said that there were only two concrete theories before the world concerning the origin of tumours: the virus theory and the gene theory. The former might be incorporated in the latter. In Paget's disease of the nipple a deep carcinoma might arise in the terminal ducts and acini, in addition to the benign superficial condition in the epidermis or upper duct openings; this could be well explained by the gene theory, and he did not believe that it was due to transplantation.

DISCUSSION.

Dr. R. J. LUDFORD showed a series of lantern slides illustrating the gene theory. Chromosomes, he said, showed no structure, and the genes were postulated to explain observed phenomena; they were estimated to measure 20–77 $\mu\mu$—far below the smallest thing that could be seen under the microscope. The human blood corpuscle measured 7500 $\mu\mu$. Nevertheless the gene was a very living concept in biology at the present time, occupying much the same position as the atom in physics. The genes were assumed to be ranged in linear fashion—many hundreds of them to each chromosome—and at each cell division each chromosome split longitudinally, so that each daughter cell contained the same number of genes as the parent cell. It was postulated that in every cell of the human body there were 48 chromosomes, 24 of maternal and 24 of paternal origin, the chromosomes being regarded as the physical basis of heredity. The number of chromosomes in tumour cells varied considerably, but at each cell division the same number passed into each daughter cell. Sex was determined by the male germ cells, some of which contained "x" chromosomes and some "y" chromosomes. The female produced "x" cells only. In some cancer cells these special chromosomes could be recognised. Dr. Ludford illustrated the transmission of colour blindness and hæmophilia as gene mutations. It was difficult to see how a cell could retain malignant characteristics over a long period of years without some alteration in its mechanism. The gene theory seemed to offer the best explanation of the phenomena of the cancer cell, although it did not lead anywhere therapeutically. Further research should be directed to discovering some as yet unknown fundamental biological process in the malignant cell.

Dr. J. C. MOTTRAM said that the mutation theory had arisen from the discovery that X radiation could produce malignancy. Once a gene was altered, it was altered for ever, and this rule applied to the cancer cell; the Jensen rat sarcoma remained to-day exactly as it had been when it was first discovered. There was no real difference between a somatic and a genetic mutation. A mutation occurring very late in development would affect a single cell. If it was a change causing rapid division, a tumour would result; if it caused some other alteration, we should probably know nothing about it. He had tried inoculating irradiated cells into animals and had produced a tumour.

Dr. W. E. GYE stressed the hypothetical nature of the gene theory, which was not accepted by all biologists. Hypothesis was being heaped on hypothesis

and analogy on analogy. Analogies were very dangerous in medicine, as in other branches of science. The pathological characteristic of cancer was the power of autonomous growth, and this was entirely explicable in terms of things known to be true in other diseases, rendering these analogies unnecessary. The production of a new tumour from a tumour filtrate was quite precise and specific; the filtrate of the Rous sarcoma always produced a spindle cell, and had been doing so for 21 years. Each filtrate reproduced the cell from which it came, two factors being necessary, an intrinsic and an extrinsic. The gene theory had had a greater advantage than any other, but remained largely speculative.

Mr. LOCKHART MUMMERY, in reply, said that the virus theory demanded the assumption that an infective agent could maintain amazing specificity for years on end; no other infective agent known would reproduce itself consistently in this way. Only something producing gene changes could do this, specially in the minute quantities used. What, he inquired, did the cell-free filtrate do in the animal into which it was introduced?

MEDICAL SOCIETY OF LONDON.

Non-infective Nephritis.

AT the meeting held on March 14th, Mr. HERBERT TILLEY, the President, being in the chair, a discussion took place on non-infective nephritis.

NEPHRITIS AS A CAUSE OF DEATH.

Dr. ARTHUR OSMAN, who opened, said the title "non-suppurative nephritis" would have better limited the debate, since most forms of nephritis encountered in practice were infective, either directly or indirectly. He invited a consideration of bilateral non-suppurative inflammation of the kidneys as a whole, disregarding the various types into which kidney disease had been divided. He first drew attention to the wide prevalence of this group of diseases in the community. It ranked seventh in importance as judged by the causes of death as given by the Registrar-General, preceding ones including cancer, rheumatism, heart disease, tuberculosis, and asthma. During the past century and right up to the present time nephritis had been steadily on the increase, except for the years 1915 to 1920, when there was a definite drop, probably connected with the war. It was not merely a question of the withdrawal from the general population of a large number of healthy men for Army purposes, as the same drop was seen in women. As chronic nephritis was a disease chiefly of the elderly, care must be taken that the proportion of elderly people to the general population was taken into account, and in this country the proportion of elderly persons living had greatly increased since 1911. Japan and U.S.A. showed a very high death-rate from this cause; and at the other end of the scale stood Turkey and Belgium, while Scotland showed better figures than did England and Wales. He had found it impossible to correlate these figures with such factors as climate, racial characteristics, and diet, but in considering these comparative figures regard must be had to such tropical diseases as malaria, and to hookworm disease and syphilis in various parts of the world; the relative consumption of alcohol might have significance, though it was difficult to say in what direction. So far, he had spoken of deaths certified as having been due to nephritis, but it would not be disputed that nephritis was present in a large number of people who appeared to owe their death to other diseases. Herringham had found, on investigating 3500 autopsies, that 22 per cent. of the cases from medical wards alone had renal disease; 37 per cent. of those with renal disease died of nephritis. It was significant that 95 per cent. of cases dying of cerebral hæmorrhage had renal fibrosis. He had analysed the histological reports of sections in 2000 autopsies at Guy's Hospital and had found that certainly 95 per cent. had chronic nephritis of a type usually called primary nephritis; there were changes in the capsule or in the glomerular tuft. In 1929, 25,000 deaths occurred in this country from cerebral hæmorrhage, and one could assume that in a large proportion chronic nephritis was a terminal event. Of 131 autopsies on cases of cirrhosis of liver 54 per cent. showed renal disease. Probably a large proportion of cases certified as having died of valvular disease of the heart had chronic nephritis. Herringham had found that of 255 patients over 20 years of age who had died from valvular disease of the heart, 36 per cent. had renal disease. These figures were based upon macroscopic inspection, but Dr. Osman thought that histological examination would probably confirm them. Many elderly persons with functional nephritis who died perhaps after operation or anæsthesia would not have died had their kidneys been functioning better. The number of such cases could not be assessed, but if any means could be found of arriving at the proportion of people who died from functional inadequacy of the kidney, he thought that nephritis would be found to range fourth among the important causes of death in this country, the position it occupied in the United States of America. He thought he had established the fact that nephritis was one of the chief causes of death in this country, and that it was still increasing.

THE INCIDENCE OF NEPHRITIS.

Prof. L. D. S. DE WESSELOW spoke of the investigation into the cause of trench nephritis he had carried out in association with Prof. H. MacLean on a very large scale. Some 50,000 infantrymen were examined, these men having just landed in France after completing three months of training at home without breaking down or being marked down into a lower category. They were not very fine physical specimens, but it was at a late stage of the war and they represented the average working population. Morning urines were examined, and after excluding all men who were passing pus or had spermatozoa, it was found that 5 per cent. had albuminuria, 2 per cent. in high degree. Epithelial casts were present in 0·84 per cent. The conclusion was therefore justified that 1 per cent. of presumably fit men were suffering from a definite grade of albuminuria which led to the passing of epithelial casts. Very few of these nephritics broke down under the exposure and dampness of trench warfare, sufficiently to cause their admission to hospital. Figures on this point were, however, largely spoiled because at this stage in the war the wastage of infantry was about 75 per cent. of the strength every three months. He did not think the men in question had hypertensive conditions, as they were men under 40, but they had a chronic latent glomerulo-nephritis, and at some time in their lives they had probably had nephritis without having known it. Hæmorrhagic nephritis was the most interesting form, and, if hypertensive nephritis was excluded, the most common. It presented possibilities of

prevention and treatment which were only just being appreciated. Acute glomerular nephritis and the ensuing chronic condition were essentially infective in origin, the infection in most cases being in the respiratory tract, though it might be anywhere in the body; 44 per cent. were attributed to tonsillitis, 66 per cent. to scarlet fever, 20 per cent. to infected wounds, 16 per cent. to pyrexia of unknown origin, 4 per cent. to otitis media. One authority had placed tonsillar origins as high as 75 per cent. Apical dental sepsis was agreed to be an important cause.

What determined the incidence of nephritis in these infections? It was not the type of organisms concerned; the condition could follow all forms of streptococci, and occasionally pneumococcal strains were found. Nor was it the severity of the infection as such; mild ambulatory cases of scarlet fever might yet lead to severe nephritis. Prof. de Wesselow regarded cold as an important factor, and it probably entered largely into the causation in trench nephritis, as the latter was common wherever stationary warfare had been established; the Federal Army in the U.S.A. suffered greatly from it. In war, too, infection was increased by the frequency of septic and verminous wounds. Many cases of acute nephritis were probably missed, since in the acute stage it was very transient. After tonsillitis many people might have glomerular nephritis as a late sequel without knowing it. He thought the present way of treating tonsillitis was irrational. A case of scarlet fever was probably detained in bed for three weeks, whereas a case of tonsillitis, which probably carried as big a risk of nephritis, was allowed up as soon as the temperature came down. He was not advocating such a long bed treatment for tonsillitis as for nephritis, but examinations of the urine in the second and third week after tonsillitis would prevent the subsequent development of nephritis in many cases. The prognosis of acute glomerular nephritis in children was admittedly better than in adults, possibly because the mother quickly called in a doctor, whereas the adult did not seek medical advice until much later. The vast majority of cases of acute glomerular nephritis cleared up, the urine being free of albumin a year later; 6000 men who had had trench nephritis showed no trace of nephritis when examined for pension.

There remained the class in which albumin and casts persisted and became chronic. A few of these ran a short stormy course, with œdema, hypertension, and renal inadequacy, and might die in a few months. Most of them, however, were relegated to a latent group, those apparently fit who yet passed casts. They constituted an obscure underworld of chronic nephritics. The condition could be said, in a general way, to shorten life, and insurance officers acted on that idea. But Addis quoted a case in which the terminal uræmia did not supervene until 55 years after the original nephritis. The infection of a kidney might persist long after the original site of infection—such as an infected finger wound—had cleared up; he had seen cases in which removal of the focal infection aggravated the kidney condition. It was wise to remove the focal infection, but in many cases the nephritic disease was not arrested by this means. There was need of evidence as to the exact effect of dealing with the focal sepsis.

Dr. BERNARD MYERS said that in children death occurred within a few years of the onset of the nephritis due to even mild scarlet fever, and in his experience treatment had been very disappointing. With regard to adults, in several families whose members began to show evidence of nephritis at about 50 years of age, none lived beyond 60; all apparently had vulnerable kidneys, the cells of which could not continue under the stress of life when the body was declining.

DOUBTFUL VALUE OF STATISTICS.

Dr. H. MORLEY FLETCHER felt doubtful of the value of statistics on such a subject as nephritis, even when emanating from the Registrar-General's returns, since so many cases were certified as having died of nephritis when that was not the fatal disease. He pointed out that most of the remarks so far had dealt with infective, not non-infective nephritis. Contrary to what Dr. Myers had said, he had found that acute hæmorrhagic nephritis in children often terminated favourably, and the child might grow up without giving evidence of kidney damage, even on renal efficiency tests. But in adults he had not seen such a case clear up; usually it terminated fatally after a short term. He thought a long-standing *B. coli* infection of the kidney might be a factor in bringing about the chronic diffuse nephritis which was manifest between 17 and 25 years of age. He went on to speak of nephrosis, and the slowly progressive cases of "renal rickets."

Dr. A. F. HURST spoke highly of Dr. Osman's work on the biochemical side, in recognition of which a number of beds and a special out-patient department had been placed at his disposal for dealing with and studying these cases. He thought some of his arguments, based on the statistics, were somewhat fallacious, especially as he added so many deaths from cerebral hæmorrhage, heart disease, and cirrhosis of the liver to his total of deaths from nephritis. One might, in the same way, say that 95 per cent. of cases of cirrhosis had some evidence of tubercle, and so should be added to the deaths from tuberculosis. He did not think it was possible to say that 20 per cent. of patients with cirrhosis died of nephritis, however severe the latter might be, because they also died from their cirrhosis. He stressed the importance of the treatment with alkalis. By prophylactic treatment after acute infections, such as scarlet fever, it was possible greatly to reduce the incidence of nephritis; in scarlet fever the mortality had come down under this treatment from 5 per cent. to under 1 per cent. He agreed that there was a danger after removing septic foci of a flare-up of the nephritic condition, and that was one of the ways in which vaccination was of value; for if an autogenous vaccine were given two or three times before the infective focus was removed the danger of such nephritic exacerbation was very greatly reduced. He regarded the constitutional factor as very important. He spoke of a family in which 25 members died of nephritis in four generations. If relatives in such families had periodic examinations, it was probable that the average life would be considerably prolonged.

EFFECT OF NASOPHARYNGEAL SEPSIS.

Sir WILLIAM WILLCOX said it would be generally agreed that prognosis and determination of ætiology was more difficult in cases of glomerular nephritis than in any other cases. He confirmed the importance of infections of the respiratory tract. In a large proportion of cases the tonsils seemed to be the starting point, but even if the tonsils were removed other septic foci were likely to be still active and to perpetuate the nephritis. During the war he was struck by the remarkable progress to recovery made by the many trench nephritis cases he saw;

he wished one could see the same in ordinary hospital cases of nephritis. A patient with glomerular nephritis left untreated went steadily downhill. He always insisted on a routine X ray examination of nasal and other sinuses in these cases; it was surprising how many revealed sepsis. He spoke of successes he had had by immunising the blood of a healthy person with streptococcus from the suffering person and giving several 20 c.cm. blood transfusions. He advocated steady perseverance in treatment, even in apparently hopeless cases.

Dr. E. P. POULTON referred to the value of the urea-concentration test and of the urea-clearance test. In removing diseased teeth, a preliminary clearing of the pockets of pus might ward off an exacerbation of symptoms.

Dr. T. JENNER HOSKIN said he had long felt that some of the old nephritic patients with hypertension owed their condition to a scarlatinal basis early in life. These people had high blood pressure before the normal time. He appreciated the great value of the alkaline treatment.

Dr. BERNARD SCHLESINGER thought the increased incidence of nephritis was to some extent attributable to a wave of streptococcal infection immediately after the termination of the war. If tonsillitis played such an important part in causing nephritis, why did rheumatic children, who showed a high incidence of tonsillitis, seldom have nephritis? In 2000 rheumatic children under his observation there was no sign of nephritis, though their urine was examined every week.

Dr. J. H. GIBBONS spoke of alcohol and syphilis as contributory factors.

Dr. H. GAINSBOROUGH alluded to unexpected recovery in cases of nephritis of severe degree. One was a postman who had the disease nine months, and had a systolic pressure of 210, high blood-urea, and renal retinitis, with advanced vascular changes; he recovered and was able to resume his work.

NEW INVENTIONS

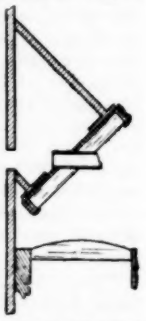
A DEVICE FOR PREVENTING GLARE IN ELECTRIC OPHTHALMOSCOPES.

THE introduction of the electric ophthalmoscope has greatly increased facilities for the examination of the interior of the eye, but the internal position of the source of the illumination within the instrument has produced certain new difficulties which the older reflecting ophthalmoscope did not possess. The electric lamp within the stem of the electric ophthalmoscope throws a beam of light parallel to the instrument, and this beam must be bent at right angles to enter the eye of the patient. Prisms and mirrors of various designs have been used to effect this bending. The desideratum is such a complete bending of the rays of light into the eye of the patient that the surgeon has a clear peep-hole through the instrument along the beam of light, and free from all disturbances such as will be caused by rays of light that may be diverted backward from the instrument so as to reach his own eye. If there are such aberrant rays the surgeon cannot see the fundus clearly by reason of the haze that is caused by the rays. The effect is somewhat similar to that disturbance to visibility produced by the rays of the head-lamps of a car when there is a slight mist at night. These disturbing effects have become more evident with the increase in power of the light available.

The aberrant rays are brought about by several conditions. If a glass mirror with a drilled hole be used in the ophthalmoscope the beam of light will impinge upon the upper edge of this hole, and no matter how it may be blackened this edge will scatter a blaze of disturbing light. If the mirror has no drilled hole, but only a gap in the silvering, the hinder surface of the glass itself will reflect any light that may fall upon it from above the ophthalmoscope, and the slightest imperfection in the glass or dust upon it will increase the disturbance.

To overcome this defect, Marple cut out the upper edge of the mirror and used one of U shape. It was very successful, but the mirror was too fragile. A polished stainless steel mirror of U shape was substituted, but this has two drawbacks in that it has a lower reflecting power and soon scratches, still further reducing the amount of light reflected. Prisms, such as were used in the first ophthalmoscopes, avoided some of the difficulties, but if they are well designed they are costly and permit very little variation of the beam, while the inexpensive ones are inefficient.

Recently, in discussing electric ophthalmoscopes with Mr. J. W. Tudor Thomas, of Cardiff, he told me that there had come into his possession an instrument the origin of which he did not know, which was free from these defects. A small tube had been fitted into the drilled hole of the glass mirror. This device is the simplest, most natural, and effective correction of the one difficulty of the electric ophthalmoscope. It does exactly what we instinctively do to protect our eyes from the glare. We shield them with our hands, or with hat-brims, or we fit vizors to the wind-screens of our cars.



Section through mirror fitted with glare shield.

A small thin-walled tube is mounted within the hole of the mirror of the ophthalmoscope, the forward end of the tube is cut at an angle so that there projects from the hole of the mirror a crescentic ledge or shield. This shield fits the lower edge of the drilled hole and projects just sufficiently to cast a shadow over the hole. When the shield is in position no aberrant rays can be diverted into the surgeon's eye, and he gets a perfectly clear view into the patient's eye. For a mirror set at an angle of 45° to the beam from the lamp, and a hole of 2 mm. diameter, the shield fitted to the lower edge of the hole must project 2·5 mm. to provide complete protection. The shield is made of metal, and is fitted to the metal bed-plate of the mirror, but is independent of the mirror glass, so that it is secure and not likely to be broken. Also the mirror glass can be detached without disturbing the metal shield.

One small difficulty arose in the use of the device. When the beam from the lamp was exactly centred to the mirror, it was found that the shield cut out the focused rays when they met at the position of the shield. This difficulty was overcome by slightly decentering the lamp, so that the beam when exactly focused upon the mirror impinged upon it to one side of the drilled hole. This decentering has no drawback. Messrs. Rayner, of New Bond-street, have fitted this shield to the new electric ophthalmoscope made by them for me, and which was described in your issue of Jan. 23rd, 1932. The device is a real advantage, and it will be the standard pattern. It has been fitted to other instruments, and has effected a great improvement in each case.

London, W. N. BISHOP HARMAN, F.R.C.S.

REVIEWS AND NOTICES OF BOOKS

Midwifery.

By Ten Teachers. Fourth edition. Edited by COMYNS BERKELEY, J. S. FAIRBAIRN, and CLIFFORD WHITE. London: Edward Arnold and Co. 1931. Pp. 740. 18*s*.

THE fourth edition of this well-known work shows changes in the personnel of the contributors, though the schools represented remain the same. Mr. Clifford White has taken the place of Mr. Russell Andrews as a member of the editorial trio. Several of the chapters have been completely rewritten and new matter has been included.

This book was written with the primary object of preparing the candidate for his final examination, but since most doctors after qualifying continue to consult their accustomed text-book, it is necessary to consider the work from the point of view of the practitioner as well as of the student. The volume contains very much that is good and a little that is less good. The teaching throughout is on orthodox lines; sometimes so strictly orthodox that the reader ceases to feel the personality of the writer behind the lines. Controversial issues are for the most part avoided, and there is perhaps some danger that the student, however hungry at the outset, who is fed so consistently on dogma, may have his appetite dulled. There are five sections: (1) the physiology and pathology of normal pregnancy; (2) normal labour and abnormal labour; (3) the puerperium; (4) the new-born child; (5) relief of pain and suffering in obstetric practice.

The first section is clearly written and well illustrated. Toxæmias are accurately described. The wisdom of placing albuminuria of pregnancy in one chapter, and pre-eclampsia and eclampsia in another, is doubtful. In dealing with hyperemesis gravidarum more information might be given as to the indications for terminating pregnancy; the significance of jaundice is not mentioned. On the other hand, the great danger of rapidly emptying the uterus from below, even when the gestation period is less than three months, deserves more emphasis than it gets here. The section on hydatidiform mole is excellent. Reference is made to Aschheim's work (the name is wrongly spelt), but not of the important application of the Zondek-Aschheim test in the diagnosis of chorion epithelioma. Syphilis in pregnancy is but scantily treated, and in order to study this subject one has to read three sections of the book—diseases of pregnancy, diseases of the placenta, and diseases of the new-born. The section on the mechanism of labour follows orthodox lines. In the section on breech deliveries no mention is made of the value of a preliminary episiotomy in a primiparous patient in order to allow of an easy delivery of the after-coming head, and the advice to deal with the arms as soon as the feet slip out may not meet with general approval. Fig. 131 does not depict a "sacroposterior position" as is stated in the legend. The section on contraction of the pelvis is very good, and the details of the management of a case of disproportion are excellent. The legends of Figs. 174 and 175 appear to be reversed. In the section on artificial infant feeding, perhaps undue prominence is given to complicated mixtures containing extra fat, lime water, and barley water. Stress is laid on the addition of extra fat to diluted cow's milk, but there is no warning of the need to reduce the fat intake in certain types of case. The addition of a "teaspoonful of 50 per cent. cod-liver oil" to each 5 oz. of feed seems to be excessive. It is curious that attention is not drawn to the danger of scorbutic symptoms developing in artificially fed infants; the use of fruit juice in supplying the lacking vitamin C is not mentioned. In dealing with white asphyxia of the new-born, the importance of protecting the child from further shock is stated, but the value of this advice is lessened by the accompanying description and pictures of Sylvester's method of artificial respiration which receives priority of place in the methods of resuscitation. The use of lobeline is not mentioned.

The volume ends with a full description of the method of giving a blood transfusion and the means whereby the blood groups may be determined. This is an excellent and valuable section and deals with a subject which is too often omitted by teachers of midwifery. We note with satisfaction that throughout the book the medico-legal aspect of the subject is constantly kept in mind, and much useful advice on these matters is given.

The book well fulfils its prime object of supplying the student with a simple and straightforward account of modern midwifery practice.

Geschlechtskrankheiten.

Second edition. By Dr. ROBERT OTTO STEIN, Professor of Dermatology and Syphilology in the University of Vienna. Munich: J. F. Lehmann. Pp. 219. M.10.

THIS is a second enlarged edition of the work by Prof. Stein which first appeared in 1921. In this country we are accustomed to look upon syphilis, ulcus molle, and gonorrhœa as the venereal trilogy, with pediculosis and scabies closely associated. Dr. Stein leaves out scabies, but includes as venereal diseases: pediculosis, herpes genitalis, molluscum contagiosum, acute ulcer of the vulva due to the *Bacillus crassus*, and lymphogranulomatosis inguinalis. The treatment described of all these conditions follows conventional lines in the main. Syphilis, however, seems to be less radically treated than in this country. Primary syphilis is defined as that stage in which, though spirochæte-positive, the Wassermann is negative when treatment starts. This is "cured" by two courses of neo-salvarsan and bismuth, with a two-month interval between treatments. The test for cure is a Wassermann negative reaction one year later. Any case then positive is treated as a secondary syphilis. Secondary syphilis is defined as any early case with a positive Wassermann. Here the treatment is three courses of neo-salvarsan and bismuth, with two-month intervals between courses. Further continuations are based on the Wassermann. A fixed positive Wassermann which is discovered six to ten years after adequate treatment, when present without clinical signs, is not considered an indication for further treatment; but a positive cerebro-spinal fluid Wassermann is a condition calling imperatively for malarial therapy. Tertiary syphilis is treated with small doses of neo-salvarsan and iodides.

The section on gonorrhœa is much less complete than that on syphilis. In the acute stages reliance is placed on the organic silver preparations, intravenous trypaflavin, and balsams by the mouth. Chronic posterior urethritis is still treated in Vienna

with Guyon's syringe and silver nitrate. The section on gonorrhœa in women is disappointing. None the less this is a most valuable work, mainly on account of the 75 beautifully produced and life-like coloured illustrations. With the exceptions of MacCormac's edition of Jacobi's Dermachromes, and McDonagh's work on Venereal Diseases, there is no text-book in English remotely approaching this in the excellency of its illustrations. It is a marvel of production at the price.

Fields of Psychology.

By GLENN DE VERE HIGGINSON, Assistant Professor of Psychology, University of Illinois. London: George Allen and Unwin, Ltd. 1931. Pp. 613. 15*s*.

THE title of this book has been wisely chosen because its subject matter illustrates the breadth and comprehensiveness of psychological facts and psychological methods. As the book concerns a study of man in relationship to his environment, the author has found it necessary to deal with heredity and environment and animal behaviour exhibited in reflexes, tropisms, and instincts. This gives a useful background to individual human psychology. The psychology of social formation and such differential phenomena as race, sex, and temperament are then discussed. Interesting chapters are devoted to efficiency, and such everyday subjects as advertising and salemanship are adequately considered. The psychology of crime is dealt with in relationship to insanity, and such legal problems as testimony, responsibility, and punishment are given due attention. The book contains also some useful chapters on the varieties of mental disorder and their treatment by modern methods. It is richly documented, and for this reason is a valuable introduction for all those who wish to delve into specific psychological problems.

Towards National Health.

By J. ANTHONY DELMEGE, M.R.C.S., L.R.C.P., D.P.H. London: William Heinemann (Medical Books), Ltd. 1931. Pp. 234. 21*s*.

To those who have occasion, from time to time, to seek accurate information about the public health movements of the past, this book will be very welcome. It traces the development of hygienic ideas and practice from the time of the early civilisation of Crete, Egypt, Palestine, Greece, and Rome, through the dark and middle ages to modern times, until the passage of the Great Public Health Act of 1875. Inevitably the history of public health in this country in the sixteenth, seventeenth, eighteenth, and nineteenth centuries occupies the major portion of the letterpress, and due notice is taken of the relevant social, agricultural, industrial, political, and religious circumstances. This work is comprehensive and accurate. There are many illustrations, most of them interesting and all well reproduced, but their value would have been increased if their origin and exact dates had been given.

Journal of Pathology and Bacteriology.

THE March number (Vol. XXXV., No. 2) contains the following papers: The spleen in streptococcal infections, by J. W. Orr (London). Experimentally in rats the earliest change appears in the lymphocytes and histiocytes on the margin between the lymphoid follicles and the pulp; polynuclear leucocytes appear at a later stage.—Completely healed dissecting aneurysm of the aorta with obliteration of the sac, by T. Shennan (Aberdeen). A man of 64 in whom four partial ruptures of the aorta had occurred, the last into the pericardium and fatal. Dissecting aneurysms do not begin in atheromatous ulcers as is commonly supposed.—Some observations on anti-complementary sera, by R. D. Mackenzie and R. S. Marshall (Nigeria). Common enough in natives in Northern Nigeria to interfere with complement-fixation tests.—Natural immunity to streptococcal toxin, by L. M. Bryce and F. M. Burnet (Melbourne). Many infants start life with a supply of staphylococcal antitoxin derived from their mothers; this soon fades away and is replaced by antitoxin made by themselves in response to infection and subinfection.—Some observations on cellular immunity to snake venom, by C. H. Kellaway and F. E. Williams (Melbourne). The hearts of rabbits immunised to cobra venom are more resistant than those of normal animals in perfusion experiments, but the authors think that this is due to residual traces of antibody rather than a change in the cells themselves.—Cellular immunity and antibody in the tissue spaces, by F. M. Burnet, C. H. Kellaway, and F. E. Williams (Melbourne). Experiments on the pulmonary and coronary circulation yielded no evidence of any inherent cellular resistance in actively immunised animals which could not be explained by antibody in the tissue fluids.—The toxicity of irradiated ergosterol, by J. B. Duguid, M. M. Duggan, and J. Gough (Cardiff). An excess of vitamin D produces arterial lesions much more easily in rats on a synthetic diet rich in calcium than with normal food; the presence or absence of other vitamins is relatively unimportant.—Disease in relation to carcinogenic agents among 60,000 experimental mice, by J. M. Twort and C. C. Twort (Manchester). A valuable review of the pathology, other than neoplastic, of a great number of mice painted with various carcinogenic tars and oils, and similar substances. These do more to the animals than produce tumours; a peculiar lipoid degeneration of the liver and extensive hyaline change in the liver, adrenal, thyroid, and skin are particularly notable. Many parasites are described.—Some properties of immune sera active against fowl-tumour viruses, by C. H. Andrewes (London). Birds bearing either of two slow-growing tumours develop antibodies which neutralise the activity of filtrates of the Rous tumour.—Staphylococcal toxin and antitoxin, by H. J. Parish and W. H. M. Clark (London). Active toxin can be prepared by Burnet's method and may be detoxicated with formaldehyde. The antitoxin is efficacious against toxin and to some extent against live cultures.—Two parathyroid tumours without osteitis fibrosa; one associated with acromegaly, by G. Hadfield and H. Rogers (London and Bristol). As might be expected, tumours do not always produce the same effect.—Carcinoma of the pituitary gland with abdominal metastases, by M. D. Gilmour (Glasgow). An example of a rare degree of malignancy in a woman of 55.—The relative incidence of the human and bovine types of tubercle bacilli in human tuberculosis in Scotland, by A. S. Griffith and W. T. Munro (Cambridge and Glenlomond). Confirms with many fresh data the previous observations that bovine infections are relatively more important in Scotland than England. The explanation remains obscure.—Immunity to Jensen's rat sarcoma produced by tumour extracts, by H. Chambers and G. M. Scott (London). Tumour tissue allowed to autolyse for a short time renders rats refractory to the subsequent implantation of the same tumour.—Foot-and-mouth disease lesions in the ear epidermis of inoculated guinea-pigs, by T. Hare (London). The skin of the ear remains infective longer than other tissues; this is now shown to be associated with the presence of microscopic lesions whose evolution is described and figured.—Intra-epithelial spread of squamous-celled carcinoma, by H. E. Harding (Sheffield). On the thigh of an old woman; analogous to Paget's disease of the nipple.

THE LANCET.

LONDON: SATURDAY, MARCH 19, 1932.

MATERNITY HOSPITAL SERVICES.

THE functions of a maternity hospital differ from those ordinarily fulfilled by a general hospital by the inclusion of attendance on patients in their own homes and by the much more prominent place occupied by services of an educational and social character. Since the supervision of the expectant mother came to be recognised as an integral part of midwifery practice, wider developments have taken place in varying degree and along somewhat divergent lines in individual institutions and there is great need to facilitate comparison of methods employed and results attained for the information and common good of all hospitals concerned. The paper by Prof. MUNRO KERR and Dr. MACLENNAN on the factors influencing mortality in maternity hospitals (see p. 633) is a sequel to one published last year [1] on the mortality and morbidity in the domiciliary services of maternity hospitals in which Dr. SHARMAN collaborated with Prof. MUNRO KERR. The two together form a striking picture of the work done by a large maternity hospital. The communication in our present issue describes an attempt to follow the plan adopted in the Interim Report of the Departmental Committee on Maternal Mortality and Morbidity, that of classifying the deaths by a form of inquest, or post-mortem inquiry, under the heading of the particular "primary avoidable factor" thought to have determined the tragedy. Admittedly the determination of such a factor must be largely a matter of personal opinion, but though investigation of all cases by one observer may be impracticable, at least an agreed form of presentation is essential to progress. Many interesting points arise out of the more recent study and these are clearly summarised at the end of the paper. Here we would draw attention particularly to the discussion of the institutional problem, where the various factors affecting the results obtained by an institution are considered. The authors complain of the difficulty confronting those who attempt to compare the results attained by the different institutions because of failure to record them in accordance with the unified system proposed by the Obstetrical Section of the Royal Society of Medicine some years ago, after consultation with the larger maternity hospitals throughout the country. This first step in the right direction was a very useful piece of work. To be effective, however, the plan outlined must be adopted by all concerned and it is to be hoped that the few remaining hospitals that continue to issue reports of the old individualistic type will soon appreciate the advantages of a uniform pattern in the presentation of material facts.

One conclusion reached by Prof. MUNRO KERR and his collaborator is that "hospitals with a unified control, or, better still, with a resident master, show the most satisfactory results." From the point of view of teaching, whether of undergraduates or post-graduates, the superiority of what may be termed from its outstanding example, the "Rotunda" system is generally admitted. This system was the one advocated by the Obstetrical Section in a memorandum issued in 1919 on the training of medical students. It gives opportunities for continuous teaching on obstetric complications that cannot be obtained under the system of a visiting staff and enables the student to see the conduct of a case throughout its stages by a senior and experienced officer. The new evidence that it is also advantageous in the care of patients strengthens the plea for its wider adoption. Two factors apart from the organisation of the institution are thought to have an important influence in producing differences in mortality- and morbidity-rates—the nature of the population served and the type of case admitted. The fallacy arising from the latter may be minimised by recording separately the "booked" and the "unbooked" or emergency cases. The further division, as in the Glasgow figures, into emergencies sent in by doctors or midwives and those women who do not apply till the end of pregnancy or the onset of labour—many of them in order to escape a supervision they dislike—adds no difficulties, for the two together are the same as the single list of unbooked cases. It should however be remembered that the maternity hospital in Glasgow refuses no women because they have not booked and that, while the antenatal supervision of many of the booked cases was inadequate, presumably it is owing to the women not attending the clinics at all or not often enough. The efficiency of the antenatal supervision depends on other factors than the nature of the population served, such as the power of the institution to acquire the confidence of the women and thus to secure their regular attendance; visiting by nurses, lady almoners or health visitors, together with a proper system of recording which of the patients have been told to report again, will greatly lessen the number of those who fail to obey instructions. When the supervision of the "booked" cases seems inadequate, attention should be directed towards establishing closer contact with the mothers.

A test of efficiency in another direction is the degree of success attained in avoiding the transference of patients attended at home into hospital as emergencies; to this end arrangements should be made for the confinement within the hospital of women whose labour seems likely to be complicated. These aspects of maternity work were

[1] THE LANCET, 1931, ii., 201.

clearly emphasised in the earlier paper on domiciliary services where attention was drawn to the need for concentrating on an improvement in the attendance of prospective mothers. There also was shown a substantial decrease in the percentage of abnormalities in the district practice in the latter part of the period studied, due apparently to the fact that grave operations in the homes of the patients were discouraged, all cases in which abnormality was anticipated being treated in hospital. Of the 20,000 cases analysed about a fifth were attended by students and the other four-fifths by pupil-midwives, gloves being used by the former but not by the latter. A decidedly lower mortality- and morbidity-rate was shown in the cases attended by students. In this connexion a recent paper by Miss CARTER [2] who till recently was the supervising sister of the out-patient district of University College Hospital, London, is of particular interest. It dealt with the effect of better arrangements made for the nursing of the patients in their homes and contrasted the results attained with those of a preceding period before these arrangements were in force. In the earlier period the student went to the case with only a handywoman to assist him, but from April, 1930, he had with him a registered nurse-midwife who subsequently carried out the nursing of both mother and baby. Both carried masks, sterilised gowns, towels, dressings, kidney dishes and dry gloves. The antenatal care was thorough, under 5 per cent. of the patients escaping one examination at least and over 84 per cent. having more than one examination. There were no deaths on the district or among cases transferred to hospital, and the morbidity-rate was taken as the criterion. It showed that the incidence of notifiable pyrexia was reduced to less than half, from 5·2 before to 2·19 per cent. after the advent of the nurses. A strong plea is made for this conjunction of skilled nurses with the students working on the district not only for the comfort and other advantages it brings to the mother, but also for the value to the student in teaching him how to work with nurses, and how much good nursing means to the mother.

All these communications provide welcome evidence of the progressive efforts made by our great maternity hospitals to improve both their care of the woman during childbearing, and the training of medical students and pupil-midwives for the service of the whole community. More might be done to make a knowledge of the results in the institutions and the methods by which they are attained readily available, and as comparable as the variable factors in each permit, if they were set out in a common form. But the chief lesson to be drawn is that the maternity hospital of to-day must provide social as well as medical services, particularly for its out-patients, and must study the special circumstances of the individual mother if it is to do the best for her and get the best out of her.

[2] THE LANCET, Jan. 2nd, p. 42.

VACCINE TREATMENT OF DISSEMINATED SCLEROSIS.

IN our present issue Sir JAMES PURVES-STEWART and Dr. F. D. M. HOCKING report the results of the treatment of a further series of patients suffering from disseminated sclerosis with a vaccine composed of the "Spherula insularis." This body was originally described by Miss K. CHEVASSUT in cultures made from the cerebro-spinal fluid of patients with disseminated sclerosis. It is now admitted, however, that similar spherules are found in other circumstances, and the authors report that they have been observed in cultures made from the fluid in a wide range of organic nervous diseases. The spherula has thus shed its insularity and cannot be regarded as specific to disseminated sclerosis. Many successful remedies have been first adopted for theoretical reasons which have ultimately proved to be unsound. The authors claim that, although the reasons which led them to adopt the vaccine treatment of disseminated sclerosis have been shown to be invalid, nevertheless the treatment remains efficacious, and they report both serological and clinical improvement in a proportion of patients thus treated during the period of six months from March to September, 1931. The changes which are described in the cerebro-spinal fluid are similar to those reported by Sir JAMES in his previous communication.[1] At that time we expressed the view that "the significance of these changes could have been better appreciated if controls had been investigated." This criticism remains valid, for in the absence of controls we are unable to say that the fluid in untreated cases would not have shown equal or even greater changes for the better.

The clinical results described by Sir JAMES PURVES-STEWART do not in our opinion justify any conclusions as to the value of the vaccine treatment. It will be widely felt that six months is far too short a period upon which to base conclusions as to the results of treatment in so chronic a disease as disseminated sclerosis. Although Sir JAMES reports the after-histories of the four patients described in detail in his previous communication, he says nothing about the seventy patients who were at that time reported as being under treatment and who have therefore now been under observation for more than two years. No experienced clinician, "bearing in mind the well-known tendency of this disease to undergo spontaneous remissions," will feel that the vaccine treatment can be credited with the clinical improvement reported in this new series of cases. Even, however, if it could be demonstrated by observation over a number of years of treated cases and of controls that the vaccine treatment was beneficial, it would still remain to be proved whether the results obtained were better than those achieved by other non-specific therapeutic measures, for example, those which rely frankly upon the production of protein shock.

[1] THE LANCET, 1930, i., 560.

SHOULD ABORTION BE LEGALISED?

LATELY, from the Bench, Mr. Justice MCCARDIE demanded an extension of knowledge of contraception, compulsory eugenic sterilisation, and the legalisation of abortion on other than therapeutic grounds. These three measures taken together can be looked upon as practical expressions of a consistent philosophy of life which is to-day sometimes described as scientific humanism. This attitude is difficult to epitomise in a sentence. In one of its aspects it implies a disbelief in an ultimate and unchangeable moral law supernaturally revealed to man and characterising, as do physical laws, the essential nature of the universe. The scientific humanist takes his stand on the changing nature of man. As human needs change, so also must change the dogmas and moral precepts which regulate social conduct. Since he is the possessor of an intelligence greatly superior to that of any other animal, man is not only entitled but, in this view, bound to make use of his endowment in whatever way he thinks best to secure the maximum happiness and physical well-being of his contemporaries and descendants. In general it may be said that the attitude of the medical profession towards contemporary morality is humanistic rather than dogmatic. In the past, for instance, it was believed that the acquisition of a venereal disease was a heaven-sent castigation for sin. As soon as adequate means of treating venereal diseases were discovered, the question arose as to whether this point of view was compatible with the most efficient prevention and cure of these diseases. The profession had little difficulty in concluding that it was not. In the sphere of psychological medicine, likewise, it has been found that an attitude of strict ethical neutrality on the part of the physician is best calculated to induce the patient to speak of himself without dissimulation and shame, and therefore to lead to the best therapeutic results.

The many problems arising from the rapid increase of population that has occurred in all civilised countries in the last hundred years, and the recognition that much human misery can be prevented by an intelligent regulation of genetic processes, have probably been the two factors chiefly responsible for the publicity which has been accorded to Mr. Justice MCCARDIE'S remarks. Of the measures he advocated, the provision of medical supervision and instruction in birth control is now rapidly taking place, and the proposal to legalise eugenic sterilisation is receiving increasing consideration from medical men. The last and most drastic proposal—to legalise the practice of abortion—naturally excited the most violent opposition and would now seem furthest from practical fulfilment. The proposal to legalise abortion has hitherto received much less serious attention in this country than in such countries as Germany and Russia, where advocacy of this measure has, since the war, been closely linked with what may be called the birth control movement. For this reason, the appearance of a responsible book upon the subject, written primarily for the medical profession, is to be welcomed. The writer[1] holds that the increasing traffic in abortifacient proprietary preparations—most of them inefficacious—and the state of the law which permits of their indirect advertisement are strongly to be deprecated. With regard to the expediency of combining, as the Russians have done, the legal suppression of both traffic and advertisements with the provision of medical facilities for obtaining abortion, Dr. PARRY expresses himself somewhat ambiguously, but at a meeting of the Medico-Legal Society on March 15th he made it quite clear that he thought it would be deplorable for this country to follow the Russian example. In the discussion which followed, legal opinion was universally in favour of a modification of the law in this country or even of legalisation of abortion, while with few exceptions the medical members present supported the existing position. Mr. CLAUDE MULLINS feared that, in view of the widespread practice of secret abortion, public opinion might so far outstrip the law that juries would acquit prisoners in the face of the evidence, as once they used to acquit prisoners in danger of hanging for theft. The danger to the mother of abortion, even when procured under the most favourable conditions, was fully discussed, but no exact statistics were quoted to show how great this danger was. Dr. W. G. EARENZEY, K.C., pointed out that if secret abortion was as widespread as Dr. PARRY had led the meeting to believe the danger to life of the operation, even in unskilled hands, must have been exaggerated. If it were to be done at all it was better that it should be performed by skilled operators in the open. Lord RIDDELL, who took the chair, thought that women were little influenced by warnings of danger or disablement, and that the demand for the performance of abortion was increasing. The claims of the child were well supported by Dr. LETITIA FAIRFIELD; she mentioned a striking case of a woman raped on a lonely road, who might surely have been justified in attempting to procure abortion: to the profit of history she preferred to give birth to WILLIAM THE CONQUEROR. Such instances, however, are hardly relevant to the situation which has to be faced in modern England. Dr. EARENZEY took account only of the fatal cases reported as following attempts at abortion. Medical men know well that many of these escape detection; as we point out on p. 638, far more harm is done to health than is ever revealed in a court of law. The extent to which this harm is due to the disorderly haste inseparable from the secrecy in which illegal operations must be performed should be explored. "Uniformly satisfactory" statistics are said to have accumulated during ten years' experience of legalised abortion in modern Russia.[2] If these are confirmed after searching investigation they will, from the strictly medical point of view, deserve serious consideration by those planning new legislation appropriate to the outlook and habits of our times.

[1] Criminal Abortion. By L. A. Parry, M.D., B.S., F.R.C.S. London: John Bale, Sons and Danielsson, Ltd. 1932. Pp. 203. 10s. 6d.

[2] See THE LANCET, 1931, ii., 1255.

ANNOTATIONS

THE PROBLEM OF SAFE MILK.

ABOUT a year ago we summed up in a leading article [1] the current evidence on the milk problem, from which it appeared that the milk consumption of this country is considerably less per head of population than that of many others, the defect being ascribed in some part at least to the failure of all concerned to produce an adequate supply of safe milk. The problem centres around the elimination from milk of the bacilli of bovine tuberculosis, although other milk-borne diseases and dirt may act as deterrents. Mention was made of the action of the People's League of Health in appointing a committee to study the whole question of bovine tuberculosis and of the wisdom of suspending judgment until this committee had had time to report. That report, which is now in print,[2] deserves the closest study. The committee itself comprised approximately 100 of the most eminent authorities in the country on every side of the question—medical, veterinary, laboratory, agricultural, and industrial—and it appointed three subcommittees to investigate the incidence of bovine tuberculosis and the most effective means of preventing its spread among cattle and man. The late Mr. E. B. Turner was its first chairman, then Dr. W. G. Savage. It is sufficient to say that no more representative or competent body could possibly be collected in this country to discuss this matter.

On the facts as they exist at present the findings of the committee do not disclose anything very novel. The figures of incidence are scarce, a fact which does not do credit to the Government departments concerned. In the words of the report :—

> Since no comprehensive body of statistics exists in Great Britain other than that in Dr. Savage's books, and since no extensive testing over the whole country or even over a whole county has ever been made, calculations have to be based on samples, the majority of which have not been taken at random.

There is no system by which the results of tuberculin testing or of abattoir statistics are collated. One reason for this deficiency is, conceivably, that the returns of tuberculin tests are confidential, but the committee was evidently considerably handicapped by the absence of this information. The Ministry of Health provided figures for a limited period, and other figures were provided by various investigators, and some were taken from the returns of foreign countries for comparison. The average of the figures available shows that at least 40 per cent. of the cows in this country are infected, though only a minority are infective; that about 0·2 per cent. of all cows are suffering from tuberculosis of the udder, and are therefore probably excreting living tubercle bacilli in the milk; that about 40 per cent. of cows slaughtered in public slaughter-houses show naked-eye lesions of tuberculosis; and that an average of 6·7 per cent. of raw market milk contains living tubercle bacilli. The figures for the incidence in man suggest that about 6 per cent. of all deaths from tuberculosis are caused by the bovine type of bacillus; that about 2000 deaths occur annually from this cause, mostly in children, apart from an immense amount of invalidity; and that at least 4000 cases of bovine infection develop each year. The disease has certainly diminished in the past 80 years, and the factors judged by the committee to be responsible for this decrease are improvement in milk production and in child welfare, the fall being accelerated during recent years by pasteurisation and sterilisation.

The part of the committee's work that demands the closest and most urgent attention is, however, its advice on the means which should be adopted to stamp out the disease ultimately, and to check its incidence and its spread while the fundamental measures are being developed, a process which must take a long time. "The obvious aim of all arrangements," says the report, "is the provision of a milk-supply untainted by the bacillus of tubercle." The Milk and Dairies Act, 1915, makes it an offence to sell milk from infected cows, but in order to convict it is necessary to prove knowledge on the part of the defendant, and the provision is therefore only of limited value. The report stresses the necessity for a clear distinction between two problems: (*a*) the eradication of tuberculosis in cattle, and (*b*) the provision of a safe milk-supply; the first problem is entirely veterinary and should be dealt with by the Ministry of Agriculture, whereas the second problem is essentially medical and should be dealt with by the Ministry of Health. Nevertheless, since the two problems overlap, it is desirable that the two Ministries should work in close coöperation on a joint plan. The measures recommended for the eradication of tuberculosis in cattle are three: (1) to increase the number of tubercle-free herds; (2) to detect and eliminate "open" cases; and (3) to encourage the perfection of prophylactic vaccination. The committee urges the necessity for official assistance in the building up of tuberculin-tested herds, and suggests several practical measures. It considers that the Tuberculosis Order of 1925 has not led to any appreciable progress towards the eradication of open cases, and anticipates that no real progress can be expected until a scheme is devised which will include the herd owner, the local authority, the veterinary inspector, and the bacteriologist. It suggests a number of points with which such a scheme should deal specifically. It holds that, in order to secure the goodwill of the farmer, an educational campaign will be necessary; in such work the veterinary inspectors could give valuable assistance. As it points out, the extension proposed is along lines already in force. It recommends that the various prophylactic vaccines available be investigated much more carefully than they have been hitherto, and that experiments both in the laboratory and on the farm should be actively encouraged. Among measures to provide a safe milk-supply, the committee rules out as obviously impracticable the wholesale slaughter of reacting cows, but regards as helpful a routine inspection of all dairy cattle by competent veterinary surgeons, if sufficient funds are available. To increase the supply from free herds, it recommends a modification of the Milk Order of 1923 to provide that new names should be given to the different grades of designated milks in order to indicate definitely the nature and quality of each; that the fee charged for a licence should be abolished; and that the number of licencing authorities should be reduced. These measures, however, belong to the fundamental campaign to free all dairy herds from tuberculosis. As practical immediate measures the committee advocates that all raw milk that does not come from

[1] THE LANCET, 1931, ii., 1037.
[2] A Survey of Tuberculosis of Bovine Origin in Great Britain. People's League of Health, 12, Stratford-place, London, W.1. Pp. 44. 1*s.* 6*d.*, postage 1½*d.*

tuberculin-tested herds should be adequately pasteurised or, if this is impossible, sterilised or boiled. It expresses a strong opinion that no such processes ought to be accepted as a substitute for cleanliness in production, though it regards pasteurisation, as defined in the regulations of the Ministry of Health, as an effective method of destroying pathogenic micro-organisms. It advises that no milk that has been heat-treated in any way shall be lawfully sold as raw milk, but that it should have some officially approved designation. The committee's findings show that the question of whether pasteurisation impairs the food value of milk has not been conclusively answered, and that considerable evidence exists that pasteurisation reduces the incidence of all milk-borne diseases; it suggests that the sale of milk from free herds as raw or pasteurised be permitted, provided that each kind is officially labelled. Finally, it adopts the suggestion—originally put forward by Dr. Savage—that the larger local authorities should have power: to require all milk sold within their jurisdiction, other than that from non-reacting herds, to be effectively pasteurised; to forbid the importation of milk heat-treated other than by pasteurisation; to enforce compulsory classification of all grades of milk sold within their areas; and to exercise adequate supervision and control over the health of all persons engaged in the industry.

We have given a brief and in some respects an inadequate summary of the findings of the committee. It is for the public conscience to say to what extent its labours are to bear fruit.

THE GERSON DIET.

THE Gerson-Hermannsdorfer-Sauerbruch diet has been tested in Norway in two different institutions with results that are, perhaps, the more impressive because they are published at a stage when critics have had time to collect failures and disappointments wherewith to produce the negative phase in the history of the "cure." At a recent meeting of the Medical Society of Oslo, a paper [1] was read on the use of this diet in tuberculosis of the skin by Prof. E. Bruusgaard, in charge of the Dermatological Department of the Rikshospital, and by Dr. E. Hval. During the past two years all the cases of tuberculosis of the skin admitted to this hospital have been given the Gerson diet with some modifications to suit Norwegian conditions. Great care was taken that the supply of raw fruit and vegetables, as well as of fresh juices, should be liberal, and the average of 2600 calories was made up as follows: protein 77 g., fat 152 g., and carbohydrate 215 g. Of the 75 cases of tuberculosis of the skin thus treated, 62 were cases of lupus vulgaris. Seventeen patients, whose treatment was limited to this diet, were rendered symptom-free—a term which conveys a warning of a possible relapse. There were 29 who were considerably improved and were still under treatment. In some cases a few lupus nodules persisted at the completion of this treatment which was then supplemented by exposures to the Finsen lamp. Among the 24 patients thus treated, 19 were rendered symptom-free, and five were considerably improved. "One may conjecture that diet combined with Finsen light will in the future be the chief treatment in skin tuberculosis." This considered opinion is the weightier for being voiced by an authority noted in the Scandinavian countries for his caution and critical sense. During the dietetic treatment, a marked improvement in the patients' general health was observed simultaneously with the changes for the better in the local condition. It would, indeed, seem that the diet has a general stimulating effect on the natural defences of the body, rather than any specific influence. The tissue-absorbing action of the diet is one of its conspicuous features. Masses of hypertrophic scar tissue, in which lupus infiltrations are embedded, are absorbed with remarkable rapidity. In this way otherwise intractable cases are rendered amenable to Finsen light treatment.

The Gerson diet for the typical clientèle seeking hydropathic establishments has recently been given a trial by Dr. E. Möinichen and Dr. H. Fröshaug,[2] of the Midtstuen hydropathic establishment near Oslo. Among their 45 patients thus treated were 23 suffering from hyperpiesis. "With a background of 25 years' experience with the physical and dietetic treatment of these conditions, some importance may be attached to our impression at Midtstuen that the Gerson diet is considerably more useful than other systems of treatment previously employed."

[1] Norsk Mag. f. Laegevid., November, 1931.

THE INSURANCE OF PEDESTRIANS.

THE heavy casualties caused by road traffic are regarded by the public with strange equanimity. The total is said to be nearly 200,000 a year, whereof roughly 1 in every 25 is fatal. Arguing that about one-half of the total happen to pedestrians or pedal cyclists, the Pedestrians' Association proposes an amendment of the law. If a pedestrian is knocked down by a motor-car, he clearly cannot recover damages if he himself was negligent; he clearly ought to recover them if the driver was negligent; but what is to happen if neither side was to blame or—a commoner case—if there is no evidence to show who was to blame? What ought not to happen, argues the Association, is that the pedestrian should suffer the whole of the loss; the driver should be made prima facie liable and in fact should pay the pedestrian irrespective of any evidence of negligence. Let Parliament pass a Bill to that effect; the cost to the motorist will only be a slight increase in his insurance premium. Most medical practitioners are motorists. They, like other motorists, will probably answer that it is wrong to remove one hardship by creating another; that Parliament sanctions the present conditions of road traffic and the motorist should not be penalised for taking advantage of that sanction; in fact that motor-cars are not man-eating tigers. To this the Association will reply that in many cases the law already imposes liability to compensate irrespective of negligence. Thus innkeepers are liable for the goods of their guests; common carriers are responsible for the goods entrusted to them; employers must compensate workmen for accidents happening in the course of their employment; railway companies must pay for damage to crops caused by sparks from engines; aeroplanes must make good damage or loss which they cause in their flight, taking off or landing; and so on. Moreover, it was long ago held to be a common law nuisance to bring upon a road a machine which is likely to frighten horses "of ordinary nerve and courage." But this last instance suggests the rejoinder that the average horse has given up shying at motor-cars and that human beings need not despair of adapting themselves to the presence and movements of machines. The statistics of road accidents seem to indicate that the young of the human species have

[2] Tidssk. f. d. Norske Laegefor., Jan. 15th, 1932.

learnt to do so more quickly than their elders. One statement in the Pedestrians' Association's case is challenging. "As the law stands, even a person killed on a pavement has no claim if the driver is exonerated from blame." It is true that in one instance, not long ago, where a motor-car mounted a pavement owing to a skid on a half-frozen road, the injured person's claim failed; the incident was held to be a mere accident and not negligence. But in another case the Court of Appeal decided that the mere fact that a motor-car was found damaging pedestrians on a pavement was at any rate some evidence of negligence. Is it not reasonable to retain some distinction between the motorist who is, and the motorist who is not, negligent?

EAR DISEASE IN FEVER HOSPITALS.

THE problems of prevention and treatment of ear disease in fever hospitals differ from those in ordinary practice, and the clinical conditions and the methods of treatment adopted are not necessarily applicable elsewhere. That part of the annual report of the London County Council for 1930[1] is allocated to Mr. T. B. Layton's account of the treatment of ear disease in the fever hospitals under the Council's control; this makes interesting reading for otologists. When he was first appointed otologist to the fever hospitals ten years ago, his conception of ear disease was that the inflammation spread from the throat to the middle ear, stayed there awhile, and then passed over to the mastoid region. He now believes that the inflammation involves the mucous membrane of the entire middle-ear cleft practically simultaneously in the majority of cases, and that it often subsides with or without rupture of the drumhead. This later view is in conformity with what we believe to be the opinion of most otologists. Early paracentesis of the membrana tympani is generally considered to be of immense value in cutting short the disease; but in Mr. Layton's work, chiefly among little children suffering from scarlet fever, he has found small help from this operation. The principal reason for this failure is the inability to get the patients at the right time, for in scarlatinal otitis pain is rare and, when it occurs, only precedes rupture by an hour or so, rise of temperature is an unreliable guide, and the first symptom of ear disease is a discharge on to the pillow. Routine daily examination of all drumheads was proved impracticable; it took Mr. Layton three hours to examine both ears of 60 patients, and such an examination every day is obviously impossible; but with this early rupture of the drum paracentesis is hardly necessary, though this need by no means diminish the conception of its value in other forms of otitis. In conformity with most of his colleagues, Mr. Layton believes that the cause of chronicity is secondary infection from the meatus; he is further of opinion that the growth of the organisms present in the skin of the meatus can be repressed by keeping the skin dry. He has therefore discontinued syringing and the use of peroxide of hydrogen in the routine treatment of discharging ears, and employs only spirit or glycerin as the basis of applications. But he relies almost entirely on frequent mopping out of the meatus with cotton-wool mops, and teaches quite young children to carry out the procedure for themselves. This is doubtless a very successful method of treatment, but it could be criticised on the grounds that it is impossible to keep the meatus dry when the ear is discharging freely, and that secondary infection may be introduced from the children's hands on to the mops as well as from the meatal skin. In the treatment of mastoiditis with retro-aural swelling, occurring in the acute stage of the fever, he employs Wilde's incision, operating later on the mastoid, however, if the middle ear does not get well. All cases in which otorrhœa persists for more than 21 days are entered in a special report; a number of these are placed in the category of "symptomless mastoiditis," because they have no tenderness or any symptoms except discharge. Mr. Layton does not approve of removing adenoids or tonsils in these cases; he admits that in a small number of cases removal of the lateral portion of the nasopharyngeal lymphoid tissue has had a good effect, but says that there have been as many failures as successes. In our view this small operation would be justified if it succeeds in even 50 per cent. of cases. His objections to a more complete operation are that it removes lymphoid tissue which the patient needs, and that it results in compensatory hypertrophy of such lymphoid tissue as is left. The more usual view is that there is excessive hypertrophy of the lymphoid tissue in such patients, and the general experience is that its removal is frequently followed by cessation of the otorrhœa; the excellent effect on the ear of this operation is also seen in the improvement of hearing which it produces in cases of catarrhal deafness. It is true that hypertrophy of the lymphoid tissue in the pharynx sometimes follows extirpation of tonsils and adenoids, but this is not by any means the rule and does not occur until after the ear has healed. Mr. Layton acknowledges that his views on this matter are quite contrary to those that may be deduced from certain statistics that have been published, but holds them none the less firmly.

[1] London County Council. Annual Report, 1930. Vol. IV., Part III. P. S. King and Son. No. 2877. 5s.

THE DIAGNOSIS OF CHOLECYSTITIS.

ELSEWHERE in this issue Prof. D. W. Carmalt-Jones calls attention to a physical sign which he regards as significant of disturbance of gall-bladder function. It is tenderness on palpating the lower border of the right costal margin in the region of the eighth costal cartilage. This tenderness has been fairly constantly present in patients coming under his care, though an analysis of 20 of his cases presented in his paper certainly arouses a suspicion as to the validity of the interpretation he places upon this sign. For though in only two of the 20 cases was such tenderness absent, it was found in five patients who had previously been operated upon for cholecystitis. Presumably some at least of these five people had lost their gall-bladders. Viewed from this aspect, Dr. Carmalt-Jones's contribution invites reflection on that group of patients who suffer from abdominal pain, often in attacks, which simulate very closely those associated with definite visceral disease, and in whom a laparotomy fails to reveal the expected cause, or indeed any demonstrable lesion. It arouses speculation about the true cause of referred pain in abdominal disease. Is there such a phenomenon as a viscero-cutaneous reflex of pain, as Head and Mackenzie believed, or is there only a peritoneo-cutaneous spread which can only occur when the inflammatory process has extended to the parietal peritoneum, as Mr. John Morley would have us believe? There are powerful arguments on both sides, and convincing proofs that one or other of these mechanisms does not exist is wanting. That some other condition is present in the obscure

abdominal affections already referred to is certain, and the observations of J. B. Carnett, set forth in a number of contributions,[1] are illuminating and suggestive. In effect, he believes that a neuritis of the nerve trunks supplying the abdominal wall is a quite common complaint, a neuritis which may be, but is not necessarily, due to some infective focus in the abdomen, possibly the gall-bladder. More than four years ago he discussed[2] the mimicry of gall-bladder disease in cases of neuritis of the ninth and tenth right intercostal nerves. He mentioned the identical pain at the costal margin rediscovered by Dr. Carmalt-Jones, and sometimes a hyperæsthesia. There are, perhaps, other tender points, where the nerves perforate the rectus sheath or where the lateral cutaneous branches emerge. He insists that the tenderness is as pronounced when the abdominal muscles are thrown into contraction as when they are relaxed, and avers that the spontaneous pain may vary from a dragging sensation to a disturbance which cannot be distinguished from a colic. It is therefore interesting to read that Dr. Carmalt-Jones has found cases of "apparently typical bliary colic, with a tender cartilage," in which at operation "a normal gall-bladder was found." Whether Carnett's views will be established must depend upon the observation of other clinicians. He is careful to point out that the discovery of such parietal neuritis does not exclude gall-bladder disease, and indeed is found often to accompany it; but when other reliable signs, particularly jaundice, the presence of a palpably distended gall-bladder, or a positive dye test are wanting, it does not seem justifiable to proceed to operation.

GOOD AND BAD PROPAGANDA.

THE new British Health Resorts Association has a useful part to play in the near future, and we hope and believe that it will prove equal to its task. But there is undoubted danger in the circumstances of its foundation. At the Hastings conference reported in our columns last week, Lieut.-Colonel R. H. Elliot rightly insisted that the movement would lose the present support of the medical profession if it showed signs of commercialism; but he might have gone further and disclaimed medical interest in any appeal to narrow patriotism. As a profession our object is to treat our patients as well as possible—not only to treat them with British remedies. It would be a great pity if supporters of this Association were to spoil their case by ignoring or dismissing the virtues of foreign travel and foreign cures. No amount of proclamation to the contrary will prevent our remembering that complete change of language, scene, people, food, and climate is often as useful as it is recreative. But this does not mean that the Association has no object. Far from it. Supposing a Londoner felt that Hyde Park might be made more beautiful and that more people might be drawn to enjoy it. Would he begin by saying that the Park had all the charms of the country—birds, lakes, trees, and all complete? If he was wise, he would surely accept the inherent limitations of Hyde Park and say that it was our duty to make it as beautiful as possible, since many Londoners could never go further. It so happens that Hyde Park has in fact become very charming in its peculiar way, so that it is worth while for visitors from the country to come to see it. This, however, is not so much the result of propaganda as of planting bulbs and introducing foreign birds, and employing artists. The amenities of the countryside—that is to say of foreign parts—are again available to rich people now that the ban on money exchange has been withdrawn. At all times and in any case the rich will look after themselves. But the vast mass of our population can never go abroad for health, and it is in the interests of this majority, which at present goes lacking what it could easily have, that we would like the British Health Resorts Association to work. There is much to be done on our coasts, much to be gained from them, and much to be learnt about them. The sense of these aims and objects is in no way dependent on a fashion in economic philosophy.

DUST IN THE COTTON INDUSTRY.

IN 1927 a departmental committee was appointed to inquire into the respiratory disease found among cotton operatives working in card-rooms. The committee worked under the chairmanship of Mr. J. Jackson, Deputy Chief Inspector of Factories, and had as secretary Dr. S. A. Henry. The medical profession was also represented by Prof. George Murray. In the report now published[1] some valuable information about the conditions of the workers is to be found. In the historical review it is pointed out that THE LANCET published one of the first papers to draw attention to the injurious effects of dust in this industry.[2] Various suggestions have since been made as to the exact constituent of the dust which is responsible for damage to health and this problem is still unsolved. The constituents in the dust liberated during the processes of stripping and carding are fragments of cotton hairs and of leaf and seed coat, fungus mycelium, spores, bacteria, and mineral matter; the greatest amount of dust is found in Egyptian cotton. The committee find that much of the dust is due to lack of adequate cleaning of the cotton in the preliminary blowing-room process, and yet more to the practices of "wafting" and "brushing down" to remove dust which has settled on the machinery. A pharmacological test showed that histamine or some allied product was present in aqueous extracts of the finer portions of card-room dust, and this is considered to be capable of causing ill-health, but an allergen may also be present.

The clinical investigation of operatives showed no specific conditions but merely an ordinary bronchitis such as that which occurs in the general population. The committee found that the reduction of dust and improvement in ventilation already carried out had certainly reduced the amount of discomfort and ill-health, but that the sickness-rate from respiratory disease is still higher among male card-room operatives than among other male cotton operatives. There was no marked incidence of tuberculous disease, of silicosis, or of aspergillosis. The committee are of the unanimous opinion that the present excess of sickness among card-room operatives could be considerably reduced, if not eliminated, were the cotton more thoroughly cleaned in the earlier stages—either in the blowing-room or in the process of ginning before import. They consider that an abnormal sickness-rate among workers in a card-room should be regarded as prima facie evidence that dust is not being sufficiently removed and/or that the ventilation is inadequate.

[1] Amer. Jour. Med. Sci., 1927, clxxiv., 579; and Med. Jour. and Record, 1929, cxxix., 64.
[2] Ann. of Surg., 1927, lxxxvi., 747.

[1] Report of the Departmental Committee on Dust in Card-rooms in the Cotton Industry. H.M. Stationery Office. 1932. Pp. 96. 1s. 6d.
[2] THE LANCET, 1863, ii., 648.

They suggest that dust from the flat brush and comb could be reduced by slowing down the brush, and that when a stripping brush is used on a vacuum stripper it should be provided with a cover connected to an exhaust. They would prohibit wafting altogether, and insist that respirators should be worn by all workers removing dust or dirt from the engines or machinery. They recommend that a card-room should be ventilated by a downward draught, to keep the finer particles below breathing level, and they think it desirable that no person suffering from respiratory abnormality should be employed in a card-room. Periodical medical examination would also weed out those who were particularly susceptible to dust or who had become partially affected by it.

Perhaps the most important piece of information that emerges from this careful report of a difficult and complicated investigation is the discovery of histamine in the dust, for, if this substance be present, no method of ventilation at present available can be relied upon to protect the workers. The committee draw attention to the importance of further immediate exploration of this problem.

THE ALPS FOR BIRMINGHAM CHILDREN.

WHEN Mr. Christian Kunzle, head of the firm of C. Kunzle, Ltd., chocolate manufacturers, was last week elected president of the Birmingham Children's Hospital, he announced a scheme he had in mind for giving ailing children the chance of an Alpine cure. Mr. Kunzle now owns the château in his native valley of Davos, originally built by Mr. Buol on the sunny slopes of the Dorfberg and Schiahorn, the greater part of which are included in the estate, and for some years has envisaged the possibility of its use on a large scale as a convalescent resort for weakly people of the hospital class. With this in view, he has gradually bought land in the neighbourhood of his château, and he is prepared to give building sites on this estate for convalescent homes or sanatoriums to house those who are unable to pay for accommodation in existing institutions. Many of his work-people have already enjoyed a holiday in the château, and now to demonstrate the beneficent possibilities of Alpine residence for children to his fellow citizens in Birmingham he has placed at the disposal of the hospital for a period of two years the ground floor and dependance of the château, to which a play and school room and verandahs are being added, providing accommodation for 25 to 30 children and five nurses. The first group of children, which will leave Birmingham on May 26th next, is to consist chiefly of ambulatory cases of asthma, chronic bronchitis, mild pulmonary fibrosis and bronchiectasis, glandular tuberculosis, tuberculosis contacts, children convalescent from a long illness, such as osteomyelitis or empyema, and perhaps a few cases of bone or joint tuberculosis. These children will remain in Davos for a period of three months or longer, and if the experiment proves successful it is intended to establish a permanent branch of the hospital at Davos, either by the purchase and adaptation of an existing house, or by the erection of a new one. In that event the hospital would appoint a resident medical officer; for the present Dr. J. L. Burckhardt, head of the Children's Sanatorium at Davos, has consented to undertake the medical supervision of the children. The cost of the experiment is estimated at £2000 to £3000 a year, some part of which may be requited by the parents or the interested local authority; the Benevolent Fund of C. Kunzle, Ltd., has undertaken to defray the cost of transport of the first batch of children and the entire cost of their keep for three months. Should there be any vacancies children may be accepted whose parents can pay some part at least of the cost of maintenance.

ROYAL MEDICAL BENEVOLENT FUND.

AT the annual meeting of the Fund, held on Tuesday last, the income for the year was reported to be the largest since its foundation, and as a result it had been possible to help a larger number of persons whose circumstances obliged them to seek assistance. There is welcome evidence that the increase is due to the fact that the Fund is receiving support from a wider field, and that its existence and utility are becoming more generally known. In 1921 the income from subscriptions was £3801, while in 1931 the income from the same source amounted to £10,682, an increase of £6881. The income derived from investments increased during the same period from £4107 to £6956—namely, by £2849. The amount of financial help which the Committee have been able to give amounts in all this year to £14,843, as against £7292 in 1921; this does not include a grant of £224 18*s*. to annuitants under the Barr-Meadows bequest. But in spite of this increased income it has not been possible to meet all the claims made upon the Fund, nor to cover the distress which is known to exist. Appeal is accordingly again made to every medical man and woman to become an annual subscriber. Each year personal appeals are written by the Committee of the Fund to members of the profession in various parts of the country. During 1931 appeals made in Ashford, Barnstaple, Blackpool, Bognor Regis, Canterbury, Exmouth, Falmouth, Folkestone, Grays, Horsham, Lewes, Liverpool, Newquay, Penzance, Ramsgate, Sidmouth, Swindon, Taunton, Tonbridge, Tunbridge Wells, Winchester, Battersea, Harley-street, Putney, and Wandsworth brought in £93 8*s*. A special appeal was also made to British medical men and women living abroad which brought in £82 10*s*. 6*d*. Most of the response was in the form of subscriptions, which will be renewed annually. The cost of these appeals was £38 6*s*. The Christmas appeal made by the President realised £220 18*s*. 6*d*., a larger sum than in any previous year. The cost of this appeal was £3 18*s*. The committee fear that the coming may be a very difficult year, and they express the hope that each subscriber will get at least one doctor friend to give an annual contribution. Especially would they like to see greater support coming from the younger members of the medical profession.

A word of gratitude is given in the report to the whole-hearted and invaluable coöperation of the Ladies' Guild which collects funds of its own to distribute in grants for education and maintenance, the worth of which it would be impossible to exaggerate. After adoption of the report and financial statement Sir Thomas Barlow was re-elected President, Sir Charters Symonds hon. treasurer, Sir Percy Sargent and Dr. Lewis Glover hon. secretaries.

Mr. F. J. Steward has been elected representative of the Royal College of Surgeons of England upon the General Medical Council, in succession to Sir Holburt Waring.

SPECIAL ARTICLES

AN INVESTIGATION INTO THE MORTALITY IN MATERNITY HOSPITALS AND THE INFLUENCING FACTORS.*

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THE Departmental Committee on Maternal Mortality and Morbidity introduced into their Interim Report the results of a novel and interesting investigation made by a special subcommittee. This subcommittee attempted to determine in the fatal cases investigated throughout the country the reason or cause of death, or as Eden[1] puts it, "they endeavoured to pick out the point at which in their judgment the management of the cases had first gone wrong." This they termed the "primary avoidable factor."

We have been so impressed with the objective of the subcommittee in the investigation they undertook, that we have made a very thorough investigation of all the fatal cases in the Glasgow Royal Maternity Hospital for the years 1926–1930 inclusive. We feel that an investigation of this character, confined entirely to the various aspects of institutional mortality, might shed further light on the broader problem of the national maternal mortality.

The fatalities analysed represent the total deaths in the practice of the hospital, for we have included not only the deaths in hospital but also through the assistance of the Department of Health we have been able to follow up the cases of sepsis which were transferred to the fever hospitals and died there. At the outset it is necessary to mention that the number of abnormal cases admitted to the hospital is exceedingly high. In 1926, 58 per cent. of the admissions presented abnormal features. The numbers rose steadily until in 1930 the abnormal admissions constituted 70 per cent. of the admissions.

TABLE I.

Showing the number of cases treated by Cæsarean section and forceps, and the number of cases of accidental hæmorrhage, placenta prævia, and eclampsia.

Year.	Cæsarean section.	Forceps.	Eclampsia.	Accidental hæmorrhage.	Placenta prævia.
1926	125	260	69	115	86
1927	112	239	86	103	66
1928	127	226	75	131	89
1929	101	290	93	83	84
1930	184	297	59	112	94
Totals	649	1312	382	544	419

It will be observed from this table that the incidence of serious abnormality is high in the Glasgow Royal Maternity and Women's Hospital. This should be considered when the maternal mortality-rate is being discussed.

Tables I. and II. briefly indicate the extent of the work undertaken by the hospital which is run on the unit system by a visiting honorary staff.

TABLE II.

Giving a summary of the total deaths in the different categories, including deaths in cases transferred to fever hospitals on account of puerperal sepsis.

Year.	Categories.									Total.		Per cent. in all categories.
	A.			B.			C.					
	Total.		Per cent.	Total.		Per cent.	Total.		Per cent.	Cases in hospital.	Deaths.	
	Cases.	Deaths.		Cases.	Deaths.		Cases.	Deaths.				
1926	1785	27	1·5	1226	60	4·9	642	10	1·6	3653	97	2·7
1927	1616	19	1·2	1521	70	4·6	765	8	1·0	3902	97	2·5
1928	1612	22	1·3	1496	79	5·2	833	7	1·8	3941	108	2·7
1929	1347	13	0·9	1671	88	5·2	823	13	1·6	3841	114	2·9
1930	1790	23	1·3	1934	85	4·4	745	12	1·6	4469	120	2·7

Table II. shows the total deaths in the following categories.

A.—Cases under some antenatal supervision, although in many cases this could not be considered adequate.

B.—Emergency cases sent in by doctors or midwives or students working in the outdoor department. Relatively few of these had any adequate antenatal supervision.

C.—These were women who applied for admission without being seen by doctor or midwife. They were not under antenatal supervision.

The results are very far from satisfactory, especially in category B. It is dreadful to think that the mortality-rate in this group is higher than for most abdominal operations.

TABLE III.—*Showing Cases Moribund on Admission. Years* 1926–1930.

—	Categories.									Total (60).
	A.			B.					C.	
	1926	1929	1930	1926	1927	1928	1929	1930	1929	
Obstetrical complications	1	—	—	3	1	—	1	1	—	7
Accidental hæmorrhage.	—	—	1	1	—	4	4	3	—	13
Placenta prævia ..	—	1	—	1	2	—	1	2	1	8
Post-partum hæmorrhage	—	—	—	3	—	2	—	6	1	12
Toxæmia pregnancy ..	—	—	—	8	3	1	2	1	—	15
Pulmonary complications	—	—	—	1	1	—	—	—	—	2
Abortion ..	—	—	—	—	1	—	—	1	—	2
Miscellaneous .	—	—	—	—	1	—	—	—	—	1

No fatal cases were recorded in categories A in 1927–1928, and in C in 1926, 1927, 1928, and 1930. As the total deaths occurring in hospital during the five years was 536, the 60 cases accounted for in this table represent 11·1 per cent. of the total. Further, it will be observed that the deaths with relatively few exceptions occur in patients who had received little or no antenatal care. We also consider that faulty judgment in treatment must be regarded as a potent factor in causing these deaths.

To determine the primary avoidable factor in the institutional deaths was now our task. As Table II. included all cases which died under our roof, it was

* Based on the Indoor Practice of the Glasgow Royal Maternity and Women's Hospital for the years 1926–1930 inclusive.

[1] Proc. Roy. Soc. Med., 1931, xxiv., 401.

first necessary to adjust this table by deleting from it those cases which were moribund and in a hopeless condition on admission. Those cases (60 in number) which were admitted to hospital moribund, and who died within six hours of admission without active treatment being possible, are deleted from our ultimate consideration of institutional fatalities. (Table III.)

It is our opinion that many of these cases would have been better to have been treated in their own homes. A patient who is suffering from a marked degree of shock, or one who is exsanguinated from post-partum hæmorrhage, is often rendered more seriously ill by her journey in an ambulance from home to hospital.

When a patient in the outdoor practice of the hospital requires assistance and is yet too ill to be removed, the house surgeon in charge has access to services of a senior assistant on the staff, whose duty it is immediately to attend the patient in her home. It would be of advantage if those in private attendance on similar patients to the hospital ones, and faced with similar obstetric emergencies, had the same access to obstetric specialists as do the house surgeons engaged in the hospital outdoor practice.

In Glasgow the public health authorities have already drawn up a roster of obstetric specialists who may be called as consultants to puerperal cases. It is only a step further to institute a "flying squad" of obstetric specialists to deal with urgent intrapartum emergencies which, owing to their nature, are unsuitable for transfer to an institution.

Causes of Death.

Having made the above-mentioned adjustments, we have investigated the fatalities which occurred in the institution from the point of view of the primary avoidable factor.

As far as we can judge, the death-rate of an institution is influenced by the following conditions: (1) Antenatal care. (2) Negligence of patients and friends. (3) Judgment and technique of operators.

TABLE IV.—*Primary Avoidable Factor 1926–1930.*

—	Antenatal care.	Negligence of patients and friends.	Intercurrent disease.	Judgment and/or technique.	Unavoidable disasters of pregnancy.	Total.
	Total cases, 1926–1930.					
Obstetrical complications—e.g., failed forceps, &c.	15	3	0	26	14	58
Accidental hæmorrhage	4	2	1	0	4	11
Placenta prævia	16	3	0	0	11	30
Post-partum hæmorrhage	1	0	1	2	2	6
Puerperal sepsis	13	3	3	29	42	90
Toxæmias of pregnancy	109	12	0	4	15	140
Heart disease	0	0	36	0	0	36
Pulmonary complications	1	1	13	0	4	19
Embolism and thrombosis	0	0	1	0	10	11
Abortion	0	13	0	3	10	26
Miscellaneous causes	6	1	9	2	15	33
Anæsthetic deaths	0	0	0	0	6	6
Totals	165	38	64	66	133	466

This table excludes ten cases who died of puerperal sepsis after transfer to fever hospital. Data concerning them was insufficient to assess avoidable factor. They have been already shown in Table III. and included in our totals.

(4) Complication by intercurrent disease. (5) Unavoidable disasters of pregnancy. These conditions correspond in part to those mentioned on p. 24 of the Departmental Committee's Report. It is now our intention to classify the fatal cases as far as possible under these headings. (Table IV.) The first and second headings, Inadequate Antenatal Care and Negligence of Patients and Friends, require some explanation, as they are difficult to differentiate. Inadequacy of antenatal care results from several causes: (*a*) insufficient available clinics, (*b*) faulty organisation and administration of these clinics, and (*c*) ignorance or neglect on the part of the patient and her friends. The first two factors we do not propose to discuss, as they are rapidly becoming corrected by maternity institutions and local authorities. In our analysis of the preventable factors, where there has been evidence of obvious antenatal errors in diagnosis or treatment, the fatalities resulting therefrom have been grouped under faulty judgment and technique. With regard to the third cause of inadequacy—(*c*) ignorance and negligence of the patient and her friends—failure to seek antenatal care has only been classified as "negligence," where the abnormality present has been evident to the patient herself, and where the neglect of this condition has been the primary cause of her death. Similarly, where a patient has been offered treatment or advice antenatally, and where this has been completely neglected, we have preferred to assign the primary cause of death to gross negligence rather than to lack of adequate antenatal care.

I. INADEQUATE ANTENATAL CARE.

It will be seen that inadequate antenatal care was, as far as we could judge, the primary avoidable factor in 165 out of the total of 466 institutional fatalities (35·3 per cent.). This figure is minimal, as cases were grouped under this heading only where the cause of death could be definitely assigned to a pathological condition, which could have been rectified or considerably ameliorated by prenatal care.

It is worthy of note that toxæmias of pregnancy constitute by far the greatest proportion of this group—109 out of a total of 165 in the group are toxæmias of pregnancy. That is to say, toxæmias of pregnancy constituted 66·5 per cent. of the fatal cases where inadequate antenatal care operated as the primary avoidable factor. Viewed from another angle it will be observed that there were 140 fatalities in all from toxæmia of pregnancy and 109 of these (77·8 per cent.) were due to lack of antenatal care.

Considering placenta prævia in the same way it will be seen that this condition counts for 16 out of 165 (9·7 per cent.) of the group. Also, that of the total of 30 fatalities from placenta prævia, 16 (53·3 per cent.) were due to inadequate antenatal care. In all these cases premonitory symptoms of placenta prævia (slight hæmorrhage) occurred antenatally, and had they been given due consideration at the time it is more than probable that a fatal issue could have been averted.

We would draw attention also to the 13 cases of puerperal sepsis which we have included in the first group. These cases presented abnormalities which might have been corrected. This necessitated considerable interference in labour. We discussed very carefully together the grouping of these cases. We have included them under Group I. and not under Group III. (Faulty Judgment, &c.) because of our desire to stress the point that a resultant puerperal sepsis may be on occasion due to lack of antenatal treatment.

While inadequate antenatal care has been indicated as playing such an important part in the conditions referred to, it is obvious that this primary factor may adversely affect any type of obstetric case; this is evidenced by the remaining cases which fall into the group.

II. NEGLIGENCE OF PATIENTS AND FRIENDS.

The second group which deals with cases where gross negligence is the primary avoidable factor is a much smaller group but by no means an insignificant one: 38 out of 466 (8·1 per cent. of the fatal cases) were due to this factor. The preponderance of abortion is striking. There are 13 cases out of the total of 38 in the group (34·2 per cent.). From the other aspect, 13 out of a total of 26 fatalities from abortion were a result of the patient's negligence. It is notorious that patients neglect to intimate the onset of abortion. Social, economic, and occasionally criminal reasons exist for this neglect.

The Glasgow Royal Maternity and Women's Hospital admitted 3453 cases of abortion in the five years under review. There were 26 fatal cases, 18 of which died from septicæmia. There can be no doubt that the admission of large numbers of cases of abortion presents additional difficulties in the administration of a hospital whose primary duty is to care for the parturient woman. The large numbers requiring treatment tend to cause overcrowding. Further, the majority of obstetricians consider such cases a possible source of puerperal infection. The League of Nations statistical report on maternal mortality stated[1]: "As a cause of maternal deaths it (abortion) has become more important than delivery at term."

The other cases in this group are those in which gross symptoms presented themselves and were neglected by the patient. Better education of the public to the grave dangers of neglect in pregnancy would seem to be the only solution for this type of case.

III. FAULTY JUDGMENT AND/OR TECHNIQUE.

Under this heading are grouped 66 out of the total of 466 institutional fatalities (14·1 per cent.). Again this figure (14·1 per cent.) is minimal, as we were unwilling to consider a fatality as preventable except where the judgment and technique showed some definite departure from established practice. It would be invidious to apportion blame in this group to any one source; suffice it to say that midwives, general practitioners, and obstetric specialists being fallible contribute to institutional fatalities by their occasional errors in judgment. In this respect it is our opinion that wherever possible the grosser abnormalities of pregnancy and the difficulties of labour should be treated in an institution, where the greatest facilities are available for adequate treatment of the case. It is obvious that where such treatment is necessary, the earlier the case is in the hands of the institution the greater is the possibility of success. Putting aside personal skill, it is absolutely essential to refrain from difficult obstetric operations in inadequate surroundings. The force of these observations can be readily understood by reference to Table IV., where it will be seen that obstetrical complications and puerperal sepsis comprise the greater part of the fatalities due to faulty judgment and technique.

IV. INTERCURRENT DISEASE.

Turning to the question of intercurrent disease (often unavoidable), there were 64 cases out of a total of 466 (13·7 per cent.) in which intercurrent disease was the primary factor. The cardiac cases (36) constituted 62 per cent. of the group. It is only with the most constant supervision (in hospital if necessary) that any improvement can be made in the fatalities from these cases.

V. UNAVOIDABLE DISASTERS.

Having referred in some detail to the cases in which an avoidable factor was present, we find that there are still 133 cases out of a total of 466 (28·5 per cent.) in which we can find no avoidable factor. That is to say, the antenatal care of the patient was satisfactory, there was no evidence of negligence or intercurrent disease, and the management of the case showed no departure from established practice. Yet these women died.

By far the largest proportion of these cases are those which died of puerperal sepsis, 42 out of 133 (31 per cent.). Where every care has been taken of the pregnant and parturient woman, and where despite that care the patient develops puerperal sepsis, we must in our present state of ignorance of puerperal sepsis consider the case as an unavoidable disaster. Fourteen of the obstetrical complications and 15 toxæmias of pregnancy died despite every reasonable precaution having been taken; again we consider these deaths to be unavoidable. Of the other cases in the group the same might be said.

The Departmental Committee on Maternal Mortality and Morbidity find that in 52 per cent. of the deaths which they investigated no preventable factor actually emerged. With regard to these cases they state definitely that a fuller knowledge of the exact circumstances of death would probably have revealed a primary avoidable factor. We are fortunate in our investigation in having a full knowledge of the exact circumstances of all the deaths we quote, and it is our considered opinion that 28·5 per cent. of the deaths were unpreventable. Thus by our investigation we have been able to reduce the figures representing unpreventable deaths from 52 per cent. to 28·5 per cent. When our knowledge of the ætiology of puerperal sepsis is more exact, and a satisfactory method of treatment is evolved, this figure will be still further lowered. To suggest, however, that maternal mortality can be reduced below a certain level would only create a false impression in the mind of the lay public, and saddle the medical profession with an impossible task.

The Institutional Problem.

To concentrate more particularly on the institutional problem we venture to suggest that the following additional factors play an important part:

(*a*) Type of case admitted.
(*b*) Nature of the population served by the institution.
(*c*) Organisation of the institution.

The mortality and morbidity-rate of institutions such as our own which admit any type of emergency as, for example, the "failed forceps" and the "incomplete abortion," will naturally be relatively higher than that in institutions which deal almost exclusively with the booked case. We stress this point, as the Departmental Committee (Interim Report, paragraph 202) in quoting the excellence of the results in certain institutions fail to specify the type of case admitted.

The nature of the population served by the institution undoubtedly affects the mortality-rate. Where the population served by the institution is afflicted with disease such as rickets (or exophthalmic goitre, Rhine valley), or where the population is composed

[1] League of Nations Monthly Epidem. Rep. R.E.140, July, 1930.

largely of unemployed and often debilitated patients, such an institution is carrying on its work under initial disadvantages.

With regard to the organisation of the hospital, it is obvious that the more perfect the organisation, the more favourable will be the results obtained. In this respect unified control by a Master or Chef de Clinique appears to be the most effective basis of organisation.

For the purpose of determining how far each of these factors influence the mortality-rate, we have examined the results of other hospitals. As they are well recognised hospitals throughout the country, we consider it inadvisable to name them individually; they are referred to as A, B, C, and D.

A is a group of hospitals which admit all types of cases, booked and unbooked, but which are run under the direct supervision of a master resident on the premises. They serve cities which are industrialised to a moderate degree, and to them are referred cases from the surrounding rural areas.

B is a group of hospitals which admit the booked case, and although there is no selection made in the actual booking, no case unless so booked is admitted. They serve a densely populated industrial area. They are under the direct supervision and control of one obstetrician or master who is *non-resident*.

C is a hospital which admits all types of case, serves an urban, little industrialised area and a surrounding rural area, and is staffed as a general hospital—i.e., with visiting specialists and resident house surgeons.

D is a group of hospitals admitting all types of case but serving a densely populated industrial area. The staffing arrangement is the same as C—i.e., visiting specialists and resident house surgeons.

TABLE V.

Institutions.	Years.	"Booked" cases. (Receiving antenatal care.) Total cases delivered.	Total deaths.	Mortality-rate %.	Emergency cases. (Receiving little or no antenatal care.) Total cases delivered.	Total deaths.	Mortality-rate %.	Total cases delivered.	Total deaths.	All-over mortality-rate %.
					Group A.					
1	1929 ..	—*	—*	—*	2321	12	—	2321	12	—
	1930 ..	—*	—*	—*	2258	22	—	2258	22	—
	Total .	—	—	—	4579	34	0·74	4579	34	0·74
2	1929 ..	270	1	—	812	10	—	1082	11	—
	1930 ..	350	1	—	791	3	—	1141	4	—
	Total .	620	2	0·32	1603	13	0·81	2223	15	0·67
					Group B.					
1	1929 ..	1295	1	—	15	1	—	1310	2	—
	1930 ..	1429	2	—	14	0	—	1443	2	—
	Total .	2724	3	0·11	29	1	3·4	2753	4	0·14
2	1929 ..	754	5	—	4	1	—	758	6	—
	1930 ..	846	2	—	3	1	—	849	3	—
	Total .	1600	7	0·43	7	2	—	1607	9	0·55
					Group C.					
1	1929 ..	1214	7	—	792	26	—	2006	33	—
	1930 ..	1251	5	—	907	27	—	2158	32	—
	Total .	2465	12	0·48	1699	53	3·1	4164	65	1·6
					Group D.					
1	1929 ..	338	4	—	102	4	—	440	8	—
	1930 ..	338	1	—	117	0	—	455	1	—
	Total .	676	5	0·73	219	4	1·8	895	9	1·0
2	1929 ..	2151	7	—	209	9	—	2360	16	—
	1930 ..	2174	7	—	217	6	—	2391	13	—
	Total .	4325	14	0·32	426	15	3·5	4751	29	0·61
3	1929*	—	—	—	—	—	—	—	—	—
	1930 ..	723	3	—	94	9	—	817	12	—
	Total .	723	3	0·41	94	9	9·5	817	12	1·4
4	1929 ..	1170	6	—	270	6	—	1440	12	—
	1930 ..	1153	4	—	277	14	—	1430	18	—
	Total .	2323	10	0·43	547	20	3·7	2870	30	1·05
5	1929 ..	604	7	—	288	24	—	892	31	—
	1930 ..	676	6	—	291	33	—	967	39	—
	Total .	1280	13	1·00	579	57	9·8	1859	70	3·7
6	1929 ..	995	5	—	1451	67	—	2446	72	—
	1930 ..	1209	18	—	1569	73	—	2778	91	—
	Total .	2204	23	1·00	3020	140	4·6	5224	163	3·1

* No figures available.

This table deals only with the deaths occurring in hospital after delivery. We have included all deaths occurring in patients who had been delivered outside (B.B.A.'s). Deaths after transfer to fever hospitals have not been included as it was impossible to obtain accurate information on this point from all the institutions dealt with. Neither deaths from abortion nor deaths before delivery have been tabulated as it was not possible to obtain comparable figures from all the institutions concerned.

Considerable difficulties are met with in comparing the statistics of one hospital with another. This can only be overcome by the universal adoption of a scheme such as that proposed by the Royal Society of Medicine for unification of maternity hospital reports.

In the grouping we have found that there is considerable variation in matters of detail between the institutions, but in essentials the features of their services are as described (Table V.).

TYPE OF CASE ADMITTED.

Let us first consider the results in institutions amongst booked cases as apart from emergency cases. Group A shows a mortality-rate of 0·32 per cent. in this class of case (we could not obtain exact enough information from the other hospital in this group to enable us to quote its figures).

Group B gives the following rates: 0·11 and 0·43 (percentage death-rate in booked cases). Group C: there is only one hospital in this group, and the mortality-rate in booked cases is 0·48 per cent. Group D: the figures here for booked cases are 0·73, 0·32, 0·41, 0·43, 1·0, and 1·0 per cent.

The figures for booked cases in all groups is very similar with the striking exception of one hospital in Group B, in which the rate is 0·11 per cent. and two hospitals in Group D where it is 1·0 per cent. The institution with the extremely low mortality-rate of 0·1 per cent. serves a densely populated industrial area. It deals almost exclusively with booked cases. Its work is particularly well supervised, and the antenatal care extended to the patients is very thorough. Comparatively few major operations are performed, the bulk of the work being carried out by midwives. These are the features which we consider explain the excellent results.

As regards the two hospitals in which the figures are highest (5 and 6D), they serve two of the worst industrial areas in the country where rickets is prevalent. In these hospitals the general incidence of obstetric abnormality is high.

Turning to the emergency cases, the noteworthy feature is the low mortality-rate in institutions under Group A (master and assistants resident). It will be observed that in the two hospitals[3] of this nature the mortality-rate for emergency cases is 0·74 and 0·81 per cent., as compared with those hospitals organised and served by a visiting staff, Groups C and D, which give the following rates for emergency cases, 3·1, 1·8, 3·5, 9·5, 3·7, 9·8, and 4·6 per cent.

[3] No. 2 has two assistant masters resident and two extern assistants resident. The master is in close touch but is non-resident in hospital.

NATURE OF THE POPULATION SERVED.

The effect of the type of population upon the statistics of the hospital concerned is strikingly shown in Group D, where hospitals Nos. 1, 2, 3, and 4 have considerably lower mortality-rates than hospitals Nos. 5 and 6. The incidence of rickets in the communities served by the latter institutions probably accounts to a large extent for the difference in the mortality-rates.

ORGANISATION.

The difficulties encountered in the institutional treatment of obstetric cases are chiefly in (*a*) dealing with the complications, (*b*) prevention of infection. Complications in obstetric practice in many instances appear with alarming suddenness. They demand the immediate attention of an experienced obstetrician. One would expect therefore that these hospitals, whose senior staffs are in close attendance and available for dealing with such conditions, would show the best results. Our figures bear this out. The all-over mortality-rate in Groups A and B (where unified control is the basis of organisation) varies between 0·14 and 0·74 per cent. No other hospitals approach these low figures with the exception of No. 2, Group D, which hospital has a large turnover of almost entirely booked cases (91·1 per cent.).

As regards the prevention of infection, this can only be secured by those in authority exercising the greatest vigilance in observance of meticulous detail. It would appear therefore that to attain this end, and to avoid overlapping of policy, "unified command" is necessary. The results in Groups A and B lend support to this contention.

Before leaving the question of the prevention of infection, we feel it necessary to add that the design, or laying out of a maternity hospital, must facilitate the carrying out of precautionary measures against infection. This raises a subject beyond the scope of this communication but which has a very definite bearing on institutional maternal mortality.

Summary.

1. It is not possible to assess absolutely the preventable factor in *all* cases of maternal mortality. The Departmental Committee (Interim Report) were able to do so in 48 per cent. of the 2000 cases investigated. With the advantage of a more complete set of records we have been able to assess the factor in approximately 71 per cent. of our cases. The more complete the data regarding the maternal deaths the greater will be the accuracy in determining the preventable factor.

2. The investigation has brought to light the fact that approximately 10 per cent. of the fatal cases in our hospital occurred in patients who were moribund on admission. This number materially influences institutional results.

3. Maternal mortality is influenced by intercurrent disease. Of all our fatalities, 13·7 were directly due to this factor. Cardiac disease was the most potent of the intercurrent diseases.

4. To inadequate antenatal care were attributable 35·3 per cent. of all the deaths in our hospital. The cases particularly affected were toxæmias of pregnancy.

5. Negligence of the patient or her friends were responsible for 8·1 per cent. of all the fatalities. This factor operated particularly in the cases of abortion.

6. We considered that 14·1 per cent. of the fatalities were due to faulty judgment on the part of those in charge of the patient. The cases thus affected were chiefly those in whom obstetrical complications existed.

7. The bulk of the unpreventable deaths are due to puerperal sepsis. Puerperal sepsis is not, however, entirely unpreventable, factors such as inadequate antenatal care and faulty obstetric judgment exercise a malign influence and predispose to puerperal infection.

8. The maternal mortality-rates are lowest in those institutions where the percentage of booked cases is highest.

9. A disease such as rickets, prevalent in certain districts, affects the mortality-rate of the institutions serving those districts. A high incidence of obstetric abnormality will similarly affect results.

10. The organisation of institutions should be judged by the adequacy with which the emergency obstetrical complications are dealt with, and by the precautions taken to prevent infection. In these respects hospitals with unified control, or, better still, with a resident master, show the most satisfactory results.

We wish to thank the registrars and staffs of the following hospitals for the information and statistics they have so generously afforded us: The Coombe Lying-in Hospital, Dublin; The East End Maternity Hospital, London; The Edinburgh Royal Maternity and Simpson Memorial Hospital; Guy's Hospital, London; The Jessop Hospital, Sheffield; The Liverpool Maternity Hospital; The London Hospital; Queen Charlotte's Hospital, London; The Rotunda Hospital, Dublin; and the Royal Free Hospital, London. Also we desire to thank the Public Health Department of the city of Glasgow for their valuable assistance.

THE SERVICES

COMMISSIONS IN THE ROYAL ARMY MEDICAL CORPS.

THE War Office announces that 25 permanent commissions in the R.A.M.C. are being offered to qualified medical practitioners, under 28 years of age, registered under the Medical Acts. There will be no entrance examination, but candidates will be required to present themselves in London for interview and medical examination on April 15th. Applications should reach the War Office not later than April 12th. Information as to conditions of service and emoluments may be obtained from the Assistant Director-General, Army Medical Services, The War Office, London, S.W. 1.

ROYAL ARMY MEDICAL CORPS.

Col. W. L. Steele, late R.A.M.C., is placed on the half-pay list on account of ill-health.

The undermentioned to be Lts. (on prob.): W. G. Kingston and B. St. J. Lyburn.

ARMY DENTAL CORPS.

Lts. (on prob.) W. E. Duckworth and A. N. Moon are confirmed in their rank.

ROYAL AIR FORCE.

Flight-Lt. F. K. Wilson relinquishes his commission on completion of service.

COLONIAL SERVICE.

Dr. G. W. McLean has been appointed medical officer, Leewards, and Dr. A. H. Reid, radiologist, Trinidad. Dr. J. M. Mackay, asst. director of health service, Gold Coast, has been transferred to Nigeria.

DEATHS IN THE SERVICES.

Deputy-Inspector General Stewart Frazer Hamilton, R.N., who died on March 5th at Southsea, aged 82, entered the Royal Navy as a surgeon in 1873, and in the following year joined the gun-vessel *Frolic* on the China Station. In 1884–85 he was staff surgeon of the *Dolphin* during the naval and military operations in the Eastern Sudan, at Suakin (Egyptian medal, Suakin 1885, clasp, and Khedive's bronze star). Four years later he had reached the rank of fleet surgeon; after serving on various ships he became medical officer to the *Unicorn*, the R.N. drillship at Dundee, and subsequently at the R.M.A. headquarters at Eastney and at Chatham dockyard. He retired with the rank of deputy-inspector general in 1904.

Colonel A. C. H. Gray, O.B.E., has been appointed Honorary Surgeon to the King, in succession to Colonel G. De la Cour, O.B.E., retired.

MEDICINE AND THE LAW.

Criminal Abortion.

Two men pleaded guilty at the Leeds Assizes on Feb. 29th to charges of manslaughter and of performing an illegal operation. The victim was a married woman. Last October, being then a widow with seven children, she re-married. Expecting again to become a mother, she arranged with one of the accused men that she should be operated on at his house by the other of them. She collapsed during the operation; whereupon the two men, with unspeakable callousness, dragged her out of the house in a dying condition and left her by the roadside where her body was eventually found. Mr. Justice Humphreys sentenced the man who had performed the operation to five years' penal servitude and his accomplice to 18 months' hard labour.

It may be hoped that the case may find its way to the Court of Criminal Appeal for the sake of additional publicity and in order that the Court may have an opportunity to confirm Mr. Justice Humphreys' view that the offence of unlawful abortion is a grave one. Utterances by one of his colleagues have raised doubts which this case may remove. Many who regard the question as merely one of birth control do not realise that the serious element in the crime is that life and health are endangered by the inexpert and septic methods of these furtive and unlawful practitioners. Far more harm is done than is ever revealed in a court of justice. The difficulty of obtaining evidence is notorious, and nobody imagines that the number of prosecutions represents any serious proportion of the number of offences. The accused man who conducted the operation in the Leeds case was a weaver, aged 41; his companion was a wool teaser, aged 62. As the learned judge pointed out, women seem shockingly ignorant of the terrible risks they run by putting themselves in such persons' hands. The judge observed that counsel for one of the men had spoken of the ethics of abortion, "whatever the ethics of such a crime may mean." "But," he added, "it is no part of the duty of a judge trying a case to discuss the ethics of an offence which is a crime under the laws of the country."

Notification of Diseases and Confidentiality.

In the columns of our contemporary the *Medical Officer*, a correspondent has lately raised a point of great public importance. He states that, where persons have recently died from tuberculosis, the agents of life insurance companies or societies are, in some cases, calling at the office of the local public health department or tuberculosis clinic and asking for information as to the date on which their disease was notified. When this information has been refused, there has been a renewed request, accompanied by the statement that such information is given quite readily in other towns. As the writer of the letter justly observes, there is no desire to connive at the malpractices of persons who make fraudulent declarations on entering insurance; but, unless a cynical view is taken of the word "confidential," it is a duty to refuse to give the details asked for, except under the protection of the courts.

Article II. of the Public Health (Venereal Diseases) Regulations, 1916, contained the express direction, reinforced by a departmental circular, that "all information obtained in regard to any person treated under a scheme approved in pursuance of this Article shall be regarded as confidential." The Public Health (Tuberculosis) Regulations of 1930 do not contain a similar stipulation, but they leave no doubt that secrecy is to be observed. Like previous Regulations for the notification of infectious disease, they require the notification to be enclosed in a sealed envelope; this requirement, it is added, will be sufficiently complied with if the notification is folded and sealed "in such a manner that during its transmission the particulars of the notification cannot be observed." Why this precaution if on arrival the communication may be divulged to anyone who asks? Insurance companies are entitled to full disclosure of information affecting the contract of insurance; but the duty is owed only by the person with whom the contract is being, or has been, made; the officer of a public health department is in no way the agent or representative of an insured person for the purpose of being affected by this duty. The whole system of notification of infectious diseases is a statutory breach of the medical rule of secrecy; the relaxation of the rule is strictly limited to the statutory requirement; the fact that a patient suffers from a notifiable disease does not mean that thenceforth there is no further duty of secrecy. If the Ministry of Health realises the danger which our contemporary's correspondent has revealed, it will doubtless take steps to make clear that notification is at all stages a confidential matter.

Alleged Negligence: Another Plaintiff Withdraws.

In Tudor *v.* Mein, discussed in these columns last week, an allegation of professional negligence, launched against a surgeon, was withdrawn after hearing the evidence of the defendant and two of his expert witnesses. A somewhat similar settlement of litigation, on learning what could be said on the other side, occurred at about the same date in the Supreme Court of Northern Ireland. A schoolboy at Campbell College, Belfast, had been injured accidentally by a blow from a spade while helping to level the school football field. The injury was followed by septic poisoning. Treatment proved difficult; it was said that the boy had been attended by 35 doctors, had undergone 26 operations, and had been five years on his back and was not well yet. The boy and his father brought an action for damages against the governing body of the school for alleged negligence. After the plaintiffs' case had been opened and Sir Thomas Houston had given evidence in support of it, the evidence of a second witness was interrupted by counsel announcing that a settlement had been reached. Allegations of negligence against the matron (who had treated the boy's injuries) and the headmaster respecting the general conduct of the school were withdrawn, and the defendants agreed to make a payment to the boy and his father as part of the settlement.

In Tudor *v.* Mein the revelation that there were two sides to the case and that the defendant had a satisfactory answer to the allegations of negligence, occurred after hearing the defendant himself. In the Belfast case the revelation came earlier through the defendants' counsel allowing the plaintiffs' counsel to read the proofs of the medical and other witnesses who would have given evidence for the defendants. The same question suggests itself as in Tudor *v.* Mein, why cannot means be found to convince plaintiffs at a still earlier stage that there is an adequate answer on the defendants' behalf? A great deal of time, money, and anxiety would be saved if such a discovery could be made before the briefs are delivered. If counsel can satisfy one another by a mutual disclosure of facts and opinions without leaving the decision to

judge and jury, why cannot solicitors reach a settlement in these cases without instructing counsel? It is remarkably unfortunate for a professional man who is defendant in this class of case if it be true that a plaintiff is not in the frame of mind to examine the merits of the defendant's answer until the claim has been begun before a court of law and all the allegations have been broadcast to the world.

BUDAPEST.

(FROM OUR OWN CORRESPONDENT.)

SHOULD NERVOUS CHILDREN BE TAUGHT IN SPECIAL INSTITUTES?

In a recent lecture Dr. O. J. Vértes, director of the National Secondary School for Nervous Children, stated his conviction that in cases of severe nervousness in children the only solution is the removal of the child from home. The patient at his new abode behaves timidly and awkwardly at first, but as soon as he realises that he is among understanding people he settles down. The causes which gave rise to symptoms are removed with the change of residence. The jealously guarded cherished child becomes aware of the fact that he is not the centre of the world, and that others have just as much right to consideration as he has. It is important that the parents should not visit their children too often. This advice sounds so simple that one might conclude that the despatch of the child to a good aunt's or grandmama's house would yield beneficial effects. This is, however, not so. The education of a nervous child needs trained experts, or the child becomes just as tyrannical in his new environment as he was at home. Besides apparent (not real) neglect, important curative agents are a systematic day's routine and instruction in how to work. The child should not be bored for a single moment, and should not have too much time for meditation. In the critical post-war years the number of nervous children increased greatly. These children have to be discovered and appropriate schools found for them. In Budapest the number of children educated in special secondary schools for nervous ailments is 1200.

INVENTION FOR IMPROVING THE QUALITY OF FLOUR.

D. Kuffler invented a method whereby the quality of flour is greatly improved and rendered suitable for patients suffering from dyspepsia and other digestive troubles. The invention—a biochemical process of heating the flour to a very high degree without burning or roasting it—is patented. The flour is conducted through a boiler containing superheated dry air, whereby it loses its water content and one-third of its sugar content, and—as proved by investigations made by the Royal Hungarian Cereals and Flour Experimental Station—the formation of carbonic acid diminishes to a tenth. This purified flour is particularly easy to digest, and causes no heartburn or meteorism even in patients suffering from serious gastric and intestinal troubles; it is said also to have a favourable influence on all disturbances arising out of hyperacidity. This so-called "dietetic flour" is at present stocked in Hungary only by chemists, but it is shortly to be marketed by grocers so that the general public will be able to procure it easily. It is said to suffer no change in the process of overheating, so that the foods prepared from it are undistinguishable in taste from those made with ordinary flour; the only difference is in the colour, which is darker than that of ordinary flour. Some of the Budapest clinics and hospitals have used this flour with success in the diet of patients suffering from gastric and intestinal disturbances.

ASPIRIN POISONING IN HUNGARY.

While aspirin poisoning appears to be rare abroad, in Hungary it is of common occurrence, mostly in suicide cases. The Budapest Ambulance Corps rendered first aid to 230 aspirin suicide cases in 1927, to 206 cases in 1928, and to 154 cases in 1929. The symptoms of intoxication are: vomiting, syncope, photophobia, tinnitus, and general malaise of a fairly severe degree. The pulse-rate is accelerated. The urine contains albumin and occasionally also traces of blood. The number of red blood-cells is diminished, while the quantity of hæmoglobin does not undergo any considerable change so that the condition is that of a toxic polychromæmia, with slight leucocytosis. The sedimentation rate of the blood is normal and blood pressure is slightly diminished. The poisoning takes a fairly rapid course; if there is no improvement noticeable within 12 hours from the onset of symptoms, acid intoxication supervenes. The respiration becomes deep and slow, the heart's action becomes weak, and death follows paralysis of the respiratory and of the cardiac centres. The routine treatment, as applied by the Budapest clinics, consists of gastric lavage with a well-diluted peroxide of hydrogen solution, or with bicarbonate of soda. Emetics are not recommended. Intestinal irrigations with large doses of bicarbonate of soda, repeated every two to three hours or so until the urine becomes alkaline in reaction, may be of benefit.

PHYSICIANS AND LAWYERS ON BIRTH CONTROL.

The medico-legal section of the Hungarian Social-Democratic party recently held a debate. In his opening address Imre Gyürki remarked that the increase of population to-day is an economic question, and the regulation of births is one of the most important problems of the present age. It is in vain that a great many of those who most vigorously fight in support of the percentage norm in the universities, in respect to those living, protest even against the thought of planning the regulation of births. Dr. Bela Tóth emphasised the fact that medical science is concerned also with social science. The fate, health, and disease of the individual must depend on the social conditions among which he is living. The existing law lays down that only danger to the life of the mother justifies birth control. Danger to the mother, however, may include not only danger of death, but also the reduction of capacity for work, and the dwindling of earning power. In the decision of this important problem the high infant mortality-rate, the housing conditions, and other social problems, such as the prevalence of induced abortions, must be considered. In Hungary the number of induced abortions is estimated at about 100,000 out of a total population of seven and a half millions, and the large majority of cases come from the industrial and agricultural classes. In 1925, 115 sentences were passed against those who attempted to procure abortion, but much more serious was the punishment of those who paid for the operation with their lives. From the statistics he has collected Dr. Tóth estimates the casualties due to induced abortion as 700–800 yearly, and the number of women who are affected with lasting bodily or mental troubles due to abortion as about 10,000. Dr. Latkóczy quoted the opinion of Magnus Hirschfeld, the sexuologist, that out of 1000 cases only three are brought

before the law. This means that the law, in its present form, is inadequate and non-executable. The law means well, but results are disappointing.

SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

ROYAL VICTORIA HOSPITAL TUBERCULOSIS TRUST.

THE forty-fourth report of the Trust contains legitimate expressions of satisfaction that the Trust was directly inspired by the discovery of the tubercle bacillus some 50 years ago. It is common knowledge that Sir Robert Philip studied tuberculosis at that date in Vienna, bringing back to Edinburgh an enthusiasm for the investigation and treatment of tuberculosis that has never wavered. Step by step, the group of institutions for which the Tuberculosis Trust is responsible came into existence and had a notable effect in developing the tuberculosis policy of this country. In a recent appreciation contributed to the *Zeitschrift für Tuberkulose* (Berlin) Sir Robert Philip says that all that has been attempted in Edinburgh, in relation to the problem, was inspired by the stimulus produced by the completeness and the beauty of Koch's demonstration. It was the realisation of the extent of the damage wrought by the bacillus which led to the foundation at Edinburgh of the Tuberculosis Dispensary (1887) as a receiving house and intelligence centre where information would be received and guidance given concerning the disease. Thereafter came the establishment of the Sanatorium (1894) followed immediately by the School for Tuberculous Children (1895), the opening of a pavilion for advanced consumptives by the municipality (1906), the inauguration of the Farm Colony for more continuous care (1910), the provision of a class-room and laboratory for the teaching of medical students and doctors (1912), the establishment of the chair of tuberculosis in the University of Edinburgh (1917), the opening of the Sanatorium Colony, Southfield (1922), and the establishment of a tubercle-free herd of cattle (1923).

EDINBURGH ORTHOPÆDIC CLINIC.

In January, 1931, a clinic which had been formed in 1926 was formally constituted as an independent body, to be called the Edinburgh Orthopædic Clinic. The object of the clinic is to provide massage, medical gymnastics, medical electricity, and ultra-violet ray treatment for people of limited means at moderate fees. At the first annual meeting of contributors to the clinic, Miss Gertrude Herzfeld, F.R.C.S.E., presiding, it was stated that during 1931 258 patients had been admitted and 36 patients readmitted; 5899 treatments had been given, compared with 5909 treatments during the previous year. On the actual working of the clinic for the past year there was a deficit of £98; but as the revenue accruing amounted to £140, the capital fund had been increased by £41. The clinic had been approved by the Department of Health for Scotland as a charitable institution and patients insured under the National Health Insurance Scheme might now obtain benefit through their approved societies. Mr. William A. Cochrane stated that it was an up-to-date clinic and contained everything required for remedying physical defects by these special means. It was so popular now that it had a waiting-list and the work done was of the first order. An interesting feature was the home service provided by the clinic. Cripples are well served in Edinburgh. The Rev. Ratcliffe Barnett, who has taken a keen interest in promoting the new Cripple Children's Hospital at Fairmilehead, on returning from the war, started a club here for men and lads who were permanently crippled, and it is still flourishing.

CHIROPODY IN EDINBURGH.

At the annual meeting of the Incorporated Society of Chiropodists, Dr. Craig, who succeeded Dr. Drever as Scottish Medical Secretary of the British Medical Association, referred to the excellent work done by the Edinburgh Foot Clinic. During last year they had treated over 8000 people, and there was a waiting-list of 1600. The clinic made a small charge to all patients who were in a position to pay, while treating free those not able to pay. Dr. Craig thought the general public had little idea of the mass of suffering that resulted from the kinds of foot troubles which the clinic was able to treat, and praised the good work being done there.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

THE NEW GOVERNMENT.

THE post in the Government of the Irish Free State which is of most importance to the medical profession is that of Minister for Local Government and Public Health. It is satisfactory that this office has been given to one who has considerable experience of the problems of local government, Mr. Sean T. O'Kelly, who was for many years a member of the Dublin Corporation. It is rumoured that he may have the assistance of one of the medical deputies as Parliamentary Secretary. A medical man, Dr. James Ryan, has been appointed Minister for Agriculture.

SWEEPSTAKE MONEY FOR MEDICAL RESEARCH.

In a letter to the *Irish Times* of March 12th, Dr. Henry Moore, professor of medicine in University College, Dublin, repeats a suggestion made by him more than a year ago at a meeting of the Dublin University Biological Association. He is concerned with the lack of provision for medical research in Ireland, and he suggests that a small percentage of the fruits of the Hospital Sweepstakes might be earmarked for this purpose. He states that a capital sum of, say, £200,000, would provide a fund adequate for the financing of medical research, and that such a sum would quickly be accumulated from even a small percentage of the moneys at present being devoted to the hospitals. He enumerates a few of the advances in medicine due in recent years to medical research, notably in the treatment of diabetes and of pernicious anæmia, and suggests that expenditure on research might give results of more permanent benefit than even the improvement of the hospitals. Following on Prof. Moore's letters Dr. T. P. C. Kirkpatrick, general secretary of the Royal Academy of Medicine in Ireland, writes to the same journal (March 14th) to state that the General Council of that body had prepared a scheme on the lines suggested by Dr. Moore, and were only awaiting a suitable opportunity to place it before the Minister for Justice, under whose control the Hospital Sweepstakes are conducted.

The sum received for tickets in the Grand National Hospital Sweepstake which were drawn this week was stated to be £3,365,312, of which £2,239,477 will be distributed in prizes, and £841,328 be available for the hospitals. This is an advance in the sum for the hospitals of almost £100,000 beyond that from the Sweepstake on the Manchester November Handicap, 1931.

CORRESPONDENCE

MEDICAL PATENTS.

To the Editor of THE LANCET.

SIR,—I read with interest the leading article on the Law of Medical Patents in your last issue. It seems to me that the issues at stake are of national importance, and should not be left to vested interests or Government departments to determine. Research workers who are in receipt of salaries or scholarships, or who are employed on a whole or part-time basis, are in a category of their own, and are surely not entitled to exploit any discoveries they may make for their own benefit. The benefit of their inventions should logically be vested in those who have provided the means for their discovery.

The position of the private or independent research worker is different. He has to bear the whole cost of his work, and is in an unfavourable position should he make a discovery which is patentable. To deny him such rights would be to hinder valuable research, or alternatively to drive such successful inventors to seek patent protection for their inventions in some foreign country first, afterwards obtaining similar protection in the United Kingdom through the Convention. This could not be prevented except in the unlikely event of unanimous international agreement upon the subject of medical patents.

My own case may throw some sidelights upon the question. A good many years ago I was investigating the effect of ultra-violet radiation not only upon the human subject but also upon foodstuffs and other substances. I had previously come to the conclusion that the value of "food" depends not so much upon its quantity or "calorific" content as upon the presence of "living substances"—the so-called vitamins. It seemed to me that the enormous importation of "preserved" food into this country was leading to a steady deterioration of the physique of the race, a deterioration which was naturally most felt amongst the masses of the people. The results of my researches led to several discoveries which I made no attempt to patent or keep secret. Whilst I, *at my own expense*, was testing the effect of certain of these preparations in the out-patient department of a London hospital, I was approached by a representative of a firm which had purchased the patent rights in this country of the Steenbock invention to test their preparations. My feelings may be well imagined, particularly as my own preparations proved clinically superior to those of the firm in question. These conclusions were independently verified by a number of qualified clinical assistants working with me.

Some years later I mentioned this matter in conversation, and was urged to try to obtain a patent even at this late stage. I did so, and was granted protection last December (British Letters Patent, "Treatment of Yeast," No. 354371). The Steenbock patent however, being so wide and comprehensive in its claims, is regarded by many as a "master patent."

The effect of my patent would be that, if commercially exploited, substances containing vitamins B1, B2, and D could be made and sold at such a price as would place them within the reach of every man, woman, and child in this country who needed them. But up to the present no firm has shown the intention either to benefit themselves, the nation, or the inventor, as they appear to be in awe of the Steenbock patentees. I have been informed by more than one person who could speak with authority that the Steenbock patent might not survive the acid test of the English law courts, but that no one would care to oppose the patent in such a manner because the rights are held by a University!

One is almost forced to the conclusion, Sir, that much of this talk about medical patents is unpractical, and does not offer any real solution of the actual problems. These problems are surely national, and demand the attention of statesmen.

I am, Sir, yours faithfully,

PERCY HALL.

Gloucester-place, W., March 14th, 1932.

To the Editor of THE LANCET.

SIR,—In the discussions surrounding the application of the patent laws to medical discoveries it is essential not to lose sight of certain fundamental principles: (1) It is less important to prevent a doctor making anything out of a process which he has invented than to make sure that patients are protected from spurious remedies. (2) If there is a chance of making money out of a thing people will make it despite any form of legislation or regulation or ethical convention. (3) If a man has devoted a great deal of his life, and perhaps some of his money, to the development of a process, even though it be for the relief of sickness, he is going to make whatever he can out of it. (4) A manufacturer is not going to put down expensive plant, employ trained men, and pay for publicity unless he can be guaranteed protection; in other words, he will not really make an effort to market a product unless it is patented. Most sensible people agree with these points when speaking in camera. The doctor admittedly works primarily for the relief of sickness and suffering, but it is merely cant to pretend that he is concerned only in the very far background of his mind with thought of his daily bread and butter and with the upkeep of his home and the education of his children.—I am, Sir, yours faithfully,

March 15th, 1932. GENERAL PRACTITIONER.

ARTERIAL ATONY AND ARTERIO-SCLEROSIS.

To the Editor of THE LANCET.

SIR,—I should like, if I may, to reply briefly to Dr. A. Abrahams, writing in your issue of Feb. 27th (page 480), who, unlike your annotator, has failed to understand me aright; for by the term "athletes" I understand persons of constitutionally large size who make the topmost physical achievements, requiring not only single muscle groups, but the whole bodily musculature. Not in the remotest degree did I wish to bring arterio-sclerosis into ætiological relation with the ordinary gymnastic exercises or the moderate activity in sport which is so important for everyday health. If Dr. Abrahams reads this into my article I think he does me wrong. I will gladly admit that I expressed myself in my original work too shortly for Dr. Abrahams, and I see myself obliged to prove with some figures that excessive bodily work is an important ætiological factor in the occurrence of arterio-sclerosis.

For instance, I find in the statistical tables of Braun [1] percentages of raised mortality up to 267

[1] Blätter für Versicherungsmathematik und verwandte Gebiete 1910, Part 8.

for those engaged in heavy work, such as copper-mining, in contrast with 0 for chauffeurs, 45 for cooks, and 35 for electro-technicians. North American statistics [2] show that big persons of excessive weight, and height of 185 cm. plus, show a greater mortality than smaller persons. And Hörnig [3] is of opinion that especially big powerful overweight persons, among whom athletes are to be included, show a higher mortality than normal persons. Braun [4] found an excess mortality of 50 per cent. for stage acrobats. Dr. Dublin of the Metropolitan Life Insurance Company has examined mortality and morbidity from heart disease among people who engaged in sport in their youth. The mortality varies much among the various sports and is greatest in baseball players and oarsmen. The mortality is 8 per cent. higher than among the usual insured population and 12 per cent. higher than among average sportsmen. What is most striking is that of those over 45 years 32 per cent. died of heart disease, whereas in insured persons the proportion is seldom more than 20 per cent. On the average those who in their youth as students have done some sort of sport live somewhat longer than other insured persons. That can only be explained by assuming that the average insured person has enjoyed a less happy youth than the student. But quite apart from this, it gives food for thought that those who have gone in for sport are appreciably more damaged in their cardiac efficiency than those who have not indulged excessively in sport.

As far as the blood pressure is concerned, the sharp rise of maximal blood pressure during work is certainly not without its effect on the vessels, but for the work of the heart it is not so much a question of maximal blood pressure as of the *pression efficace* in Potain's sense. Astel and Grosse [5] were able to establish a constant rise of minimal blood pressure, and of course also of the *pression efficace*, even during a three months' course of training. I believe that the results which have been obtained from a vast array of figures carry more weight than the few old Marathon runners who are remembered just because they are exceptional.—I am, Sir, yours faithfully,

Berlin, March 10th, 1932. JOH. PLESCH.

RESEARCH IN ASTHMA.

THE URINARY PROTEOSE.

To the Editor of THE LANCET.

SIR,—Dr. Freeman has on two occasions published statements [6] about a visit that he paid at my invitation to Guy's Hospital in order that we might together investigate the skin reactions of the proteose. Personally I should have thought that the results of such a visit should either have been regarded as confidential like the proceedings of the Asthma Research Club, of which he is honorary secretary, or if publication was desired a combined report of the results by those taking part in the test should have been written, or at any rate my permission should have been obtained before publication; this latter was not done.

Let me say that in his original communication I have not much objection to his statement of the result of the test, though it might have been more complete and the case I showed him was not specially "selected" as he presumes. His rhetorical flourishes, though highly coloured, were on the whole harmless; but his last description of the visit certainly requires some counter-statement, since he says that he saw at Guy's Hospital that very small differences were being taken to indicate a reaction, and he comments on "the apparent lack of caution with which these possibly chance differences were being interpreted." I feel it only fair to Dr. Bruce Pearson, who is making a careful investigation of the whole subject by injecting active and control proteose into asthmatic patients and normal subjects, to combat this statement. In the last number of THE LANCET there appears (p. 571) a short report of Dr. Pearson's paper to the Therapeutic and Pharmacological Section of the Royal Society of Medicine in which he gives the criteria of a reaction and the conclusions so far reached are briefly stated.

I should also like to refer to Dr. Oriel's demonstration before the meeting (not noted in your columns) at which five patients and two normal controls were injected with (1) an active proteose from an asthmatic case; (2) van Leeuwen's extract of human dandruff; and (3) a proteose solution from a normal patient. All who attended the demonstration noted that with the asthmatic patient the asthmatic proteose and the human dandruff gave positive results, whereas the proteose controls were normal, while in the normal subjects all three substances gave negative results. No doubt the reactions to the proteose are not as marked as reactions to pollen, and strong solutions of the proteose are apt to give tests in normal people as well as allergics. Possibly Dr. Freeman in his paper was using too high a strength of proteose solution so that nearly all his results were positive.

I am, Sir, yours faithfully,

E. P. POULTON.

Upper Wimpole-street, W., March 12th, 1932.

ANAPHYLAXIS FROM BEE-STINGS.

To the Editor of THE LANCET.

SIR,—In his interesting letter on this subject Dr. A. L. Gregg remarks that we have as yet no adequate explanation for the sudden loss of immunity to bee-stings which may occur even in veteran bee-keepers. I had occasion to seek an explanation last summer when my wife, after handling bees for two or three seasons and sustaining only local reactions of moderate severity, had the following uncomfortable experience. One day a solitary bee stung her on the scalp. Within a few seconds her eyes began to itch and she had a sensation of swelling in the eyelids and the ears. This was followed by a most unpleasant feeling of constriction in the chest and a little later by generalised urticaria. She had a soda bath and rested and within five hours was completely recovered. We were naturally anxious to understand the significance of this reaction and to know what was likely to happen on the next occasion. I put the problem to my friend, Dr. P. P. Laidlaw, who made the ingenious and, I believe, appropriate suggestion that the bee had administered an intravenous sting. In support of this my wife recollected clearly that there had been no local reaction at the point of puncture. She has since been stung with an ordinary local response. May it not be that these occasional and alarming anaphylactic seizures in persons usually immune or reacting in a local way only are due to intravenous stings? Perhaps the question of "dosage" should also be considered, for the simultaneous administration of many cutaneous stings might produce the same effect as a single

[2] Hunter: Trans. Act. Soc. Amer., 1913, vol. xii.
[3] Handbuch der ärztlichen Begutachtung, 1931.
[4] Neumanns Zeitschrift für Versicherungswesen, No. 49, 1926.
[5] Leibesübungen, Year 1930.
[6] THE LANCET, Dec. 12th, 1931, p. 1323, and March 12th, 1932, p. 562.

intravenous puncture. Apart from the possibility of acquired immunity and sensitiveness it will be agreed that there are (as with other poisons and infections) wide variations in the degree of the primary or constitutional susceptibility.

I am, Sir, yours faithfully,

Wimpole-street, W., March 14th, 1932. J. A. RYLE.

BCG VACCINE.

To the Editor of THE LANCET.

SIR,—In your issue of Feb. 20th (p. 422) Prof. S. Lyle Cummins has published a noble and highly scientific letter on B C G, and henceforth your readers can judge the exact value of preventive vaccination against tuberculosis, as it is done in France and in many other countries.

Nevertheless it seems necessary to put right certain opposite arguments, invoked by Dr. W. M. Crofton in a letter immediately following that of Prof. Cummins. Dr. Crofton says: "It does not seem to me that any reasonable person can think the B C G method a desirable way to immunise human beings against tuberculosis." He fears the use of living bacilli and prefers killed antigens. If he had himself studied these as I (and many others) have done for 30 years, he would know that dead antigens, bacilli or bacillary products, do not immunise. As for the danger of using living bacilli there is none when one uses B C G, for those who studied it seriously all know that it is innocuous. It should not be forgotten that only *living* vaccines such as Jenner's small-pox lymph, and Pasteur's vaccines against rabies, anthrax, fowl-septicæmia, yield solid and durable immunity. The *dead* vaccines used against typhoid fever, cholera, &c., can only immunise for a short time and very imperfectly.

How is it possible for a reasonable person not to understand that it is better to immunise children immediately after birth against tuberculosis by the impregnation of their organism with surely innocuous and permanently effective bacilli, than to wait for them to be immunised by an accidental virulent infection which may turn into a deadly illness any day of their lives?

I am, Sir, yours faithfully,

Dr. A. CALMETTE.

Pasteur Institut, Paris, March 9th, 1932.

TUBERCULOSIS OF CHILDHOOD.

To the Editor of THE LANCET.

SIR,—I should like to thank Drs. Toussaint and MacIntyre for their very able and practical comments on Dr. Fletcher's paper, and I should like to endorse these. Dr. Kerley, however, appears to consider that they have not appreciated sufficiently recent advances in radiological technique. But has this improvement really enabled us to discover with any degree of certainty the nature of every pathological lesion in the chest which throws a shadow on the screen or plate? I think that those with a wide clinical as well as radiological experience will answer that it has not. Many of the "pneumonic conditions" in children described are either tuberculous or epituberculous in nature, with Koch's bacillus as a primary or as a secondary infecting agent, but many are not. The differential diagnosis is often very difficult, impossible usually by radiology, and only to be established on the history or the absence in the history of lassitude, failure to gain weight, and occasional slight pyrexia. The slight pyrexia, it should be added, may only be discovered on admitting the child to hospital for diagnosis. But do all cases end in complete resolution or calcification? Do not some end in bronchiectasis and in chronic non-tuberculous pulmonary fibrosis? Of those that resolve eventually some may have been non-tuberculous, and judging by the rarity of the radiological discovery of basal calcareous shadows in adult skiagrams only a few pass on to calcification. Are we even sure that no organism except the tubercle bacillus can produce such a lesion?

In your last issue (p. 597) you quote Dr. William Munro, of the Glenlomond Sanatorium, as saying, "London observers do not appear to regard pulmonary tuberculosis as a late manifestation of a childhood infection. They are wrong and far wrong. The facts are all against them." Surely this is a very sweeping statement to make. Those of us who consider that most adult pulmonary tuberculosis, especially the more acute type so prevalent among young adults, represents a recent primary or a new infection may be wrong, but the facts are certainly not all against us. Of all the evidence which Dr. Munro seems to disregard I think the most important is that of the investigations into the health of 581 probationer nurses by Heimbeck—4 out of 282 tuberculin-positives and 67 out of 299 tuberculin-negatives developed pulmonary tuberculosis during their hospital training.

I am, Sir, yours faithfully,

C. O. S. BLYTH BROOKE,
Chief Tuberculosis Medical Officer, Antrim County Council.

Belfast, March 14th, 1932.

To the Editor of THE LANCET.

SIR,—In their reference to my paper on pre-symptomatic tuberculosis in childhood Drs. Toussaint and MacIntyre raise some interesting points. The diagnosis of enlarged tracheo-bronchial glands in children is of the utmost importance, as the condition is invariably of tuberculous origin. Efforts have been made by workers in all parts of the world to make the diagnosis clinically, but as I have said, "the number of correct diagnoses is small." A good many cases are also missed radiologically, because the X ray does not show these glands until they are comparatively very large and generally caseous. But if the X ray does show them, the diagnosis is clinched, as the appearances are unmistakable. Dr. Kerley puts the position plainly. But there still seems to be a great many people who are referring to branches of the pulmonary artery as "glands" in X ray films.

There is only one important gland which anatomically could be represented at the site of the hilar shadow, and that is the large broncho-pulmonary gland. This is never seen unless it is calcified—i.e., healed. In cases of non-tuberculous lung infection, this gland is very often enormously increased in size, but no shadow is cast by the X ray. The only glands which are identified by the X ray in the pre-calcification stage are the tracheo-bronchial and para-tracheal groups.

The question of the tuberculin test is a much more difficult one. The recent report of the Medical Research Council goes into it fully and the conclusions are conservative. Although it is generally accepted that tuberculin does not sensitise to itself, I have found that children who are non-reactors to-day may be reactors to the *same* dose of tuberculin in a

few days time. Dr. D'Arcy Hart mentions this in his report, and says that he found the percentage of error to be 5·5 per cent. in a small series. Such anomalies as these make one distrust the test in practice, and it seems that judgment should be reserved until more work has been done on the protein and non-protein fractions of tuberculin. The fact that the tuberculin reaction is not an antigen-antibody phenomenon, but an example of true allergy makes its interpretation difficult.

Drs. Toussaint and MacIntyre do not agree with the conclusion I reached on the question of contacts, and in support of their contention quote cases of miliary and meningeal tuberculosis, and cases of sputum-positive pulmonary tuberculosis in children. The comparability of their cases to mine, and the relationship of mass infection to generalised tuberculosis, is too big a subject to discuss here. In 1000 school-children examined by Barnard, Amberson, Jr., and Loew, in New York, 184 children were found [1] with tuberculous pulmonary lesions demonstrable by X ray; out of these, only eight had a certain history of contact, and a further nine a probable history of contact. This work was quoted in my paper.

I am, Sir, yours faithfully,

ERNEST FLETCHER.

Harley-street, W., March 15th, 1932.

MUCOUS FEVER.

To the Editor of THE LANCET.

SIR,—In your report of what Prof. Storm van Leeuwen said at the discussion on Desensitisation in Allergic Disease (THE LANCET, March 12th, p. 571) reference is made to "Schlamm" fever, "which he translated as *slime* fever." I understood him to say "Schleimfieber," and as the German word "Schleim" means mucus, the English translation would be "mucous fever," which is given in the New Sydenham Society's medical lexicon under *febris mucosa*. However, on looking up "Schleimfieber" in a German *Conversations-Lexikon* of 1886, I find it stated that this "febris mucosa" was a term formerly used for any one of several febrile disorders in which much mucus was secreted, but that "modern medicine" (at that time) had given up the term completely. Evidently "modern medicine" (at the present time) has taken up the term again to signify some particular, not very dangerous, febrile specific infectious disease. Does it exist in England?

I am, Sir, yours faithfully,

London, W., March 12th, 1932. F. PARKES WEBER.

*** According to W. Guttmann's "Medizinische Terminologie" (1923) *Schlamm-fieber* is an epidemic febrile disease, usually of benign course, attended with a measly rash and enlargement of spleen and liver, occurring after prolonged residence on marshy soil or the drinking of bad water. Its exacter ætiology was then unknown.—ED. L.

HÆMORRHAGIC PURPURA FOLLOWING SCARLET FEVER.

To the Editor of THE LANCET.

SIR,—The two cases of hæmorrhagic purpura reported by Dr. Gibson and Dr. Hobson in your issue of March 5th are so curious as to suggest the question whether the hæmorrhages were in fact due to scarlatinal toxin. It would be instructive to know whether hæmolytic streptococci were found and, if so, of what type. Some of the clinical features are more characteristic of a diphtheritic infection. If the infection was a hæmolytic streptococcal one, the cases lend point to the opinion that I have expressed elsewhere that even mild cases of scarlet fever should not have antiscarlatinal serum withheld from them, since even mild cases may have severe toxic complications. The ease with which desensitisation may generally be effected rules out the risk of severe protein shock.

I am, Sir, yours faithfully,

A. H. G. BURTON.

Public Health Offices, Ilford, March 10th, 1932.

[1] Amer. Rev. Tuberc., 1931, xxiii., 593.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED MARCH 5TH, 1932.

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 42 (last week 72); scarlet fever, 1482; diphtheria, 886; enteric fever, 36; pneumonia, 2064; puerperal fever, 43; puerperal pyrexia, 106; cerebro-spinal fever, 67; acute poliomyelitis, 3; acute polio-encephalitis, 2; encephalitis lethargica, 12; dysentery, 39; ophthalmia neonatorum, 118. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on March 8th–9th was as follows: Small-pox 101 under treatment, 7 under observation (last week 116 and 2 respectively); scarlet fever, 1344; diphtheria, 1565; enteric fever, 12; measles, 1810; whooping-cough, 392; puerperal fever, 19 (plus 6 babies); encephalities lethargica, 227; poliomyelitis, 3; "other diseases," 191. At St. Margaret's Hospital there were 12 babies (plus 9 mothers) with ophthalmia neonatorum.

Deaths.—In 117 great towns, including London, there was no death from small-pox or enteric fever,[1] 76 (24) from measles, 8 (2) from scarlet fever, 36 (4) from whooping-cough, 36 (6) from diphtheria, 52 (12) from diarrhœa and enteritis under two years, and 298 (47) from influenza. The figures in parentheses are those for London itself.

The reported deaths from influenza are again on the downgrade. Of the great towns Leicester stands highest with 15 deaths, followed by Sheffield with 14 deaths and Birmingham with 11 deaths. The total deaths for the year from influenza so far amount to 2937 compared with 3093 for the corresponding period of 1931. The 1932 record is now better than that of the preceding year. Liverpool reported 5 deaths from measles, Willesden and Manchester each 4. Liverpool and Birmingham each reported 4 deaths from whooping-cough. Diphtheria claimed 4 victims in each of Hull, Leeds, and Liverpool.

The number of stillbirths notified during the week was 301 (corresponding to a rate of 45 per 1000 births), including 41 in London.

PROVISIONAL DEATH-RATES FOR 1931.

Provisional death-rates per 1,000,000 population for England and Wales during the year 1931 are now available as follows:—

	Males.	Females.	Persons.
Respiratory tuberculosis	872	622	742
Other tuberculosis	169	140	154
Cancer	1,450	1,516	1,484

The maternal mortality (provisional) based on deaths primarily classed to puerperal conditions is as follows:—

Puerperal sepsis per 1000 live births, 1·66; per 1000 total births, 1·59.

Other accidents and diseases of pregnancy and parturition per 1000 live births, 2·45; per 1000 total births, 2·35.

[1] The heading Enteric Fever in this column of the Return has now been amplified so as to make it quite clear that it includes Typhoid and Paratyphoid Fevers.

PUBLIC HEALTH SERVICES

A TUBERCULOSIS AUDIT.

THE Ministry of Health has issued [1] an important report on tuberculosis written by Dr. A. Salusbury MacNalty, in the prefatory note to which Sir George Newman likens the Ministry's annual reports to the yearly audits of business corporations. The outlay on maintaining residential institutions for the treatment of tuberculosis, we are told, amounts to 2½ million pounds, exclusive of the cost of treating those tuberculous patients who are in public assistance hospitals. And this figure takes no account of the control of milk-supply, the maintenance of the dispensaries, and other sides of anti-tuberculosis work. Is the nation receiving an adequate return for such expenditure? At a time of national financial stress like the present, it is, Sir George points out, more than ever important to know the answer to this question. Dr. MacNalty's report contributes to this knowledge. Beginning with the prevalence of tuberculosis in this country, he states that the number of deaths from all forms of tuberculosis has fallen from 58,930 in the year 1901 to 37,990 in 1929. The existence of the three peaks of mortality—young adult, middle age, and old age—foreshadowed by Brownlee in 1918 are shown to have now become sufficiently marked to be demonstrable in the graphs given in the report. One of the most puzzling features in the statistical records of tuberculosis in England and Wales is the peak of mortality for the young adult woman. The rate of decline in mortality has increased for both sexes in the middle age and old age groups, and also in the young adult male group, but the decline in mortality amongst the young adult women has practically ceased. The mortality in this group is stationary at the same level as in the early days of the century. The report suggests that a secondary cause is acting at this age which is independent of the tubercle bacillus. This seems highly probable. The whole clinical picture points to the soil rather than the seed, and every phthisiologist must be seriously concerned with our failure to reduce the mortality in this group. There are not wanting signs however that the outlook for this type of case is better than it was. Earlier diagnosis is being effected and there is probably no class of case that so well repays sanatorium treatment.

On the sanatorium system in general Dr. MacNalty has assembled data from various British sources which should give a reasoned answer to those who condemn the system as wasteful and extravagant. It is not that the sanatorium system has been at fault during the last 30 years but that there has been such confusion of ideas in carrying it out. As Dr. MacNalty points out, widely different policies in selecting cases, in classifying them, in maintaining them for long or short periods, in recording results and other cognate matters of procedure, have in the past created a muddle which is only just beginning to get straightened out. In this respect we are glad to see the good results of Frimley Sanatorium stressed. The practice adopted at this institution of admitting only such cases as have been through a preliminary period of observation at the Brompton Hospital is one which public authorities might adopt with profit. Another point which should be stressed is the length of stay in the sanatorium. A discerning colleague from overseas after examining closely our English system recently expressed the view that the weakest point in our system was the shortness of the stay in the sanatorium. We are of course hard pressed to reconcile public purse and private good, but sooner or later this question will demand a solution in view of the statistics of immediate and remote results which the sanatoriums are now providing.

Our last comment on Dr. MacNalty's admirable report concerns the examination of contacts, for he was led to make searching inquiry into the system, by the expression of an opinion three years ago in these columns [2] that the examination of child contacts as usually conducted in the dispensary was futile. Since that date statistics for various county areas —e.g., Lancashire, Worcestershire, Devon—and for hospitals such as Brompton, have been published which show that the tuberculosis death-rate amongst contacts is considerably greater than amongst the general population, and we readily admit that the Ministry have made a good case for regarding properly conducted contact examinations as a valuable part of the tuberculosis officer's work. It is not contact examination per se which is futile, it is the lack of perspective so often applied to it which is to be deplored. Such inquiries as are cited in the report have their place and we trust that their scope will be extended, but we should be sorry to see the tuberculosis officer rendered ineffective by sheer weight of numbers, and his clinical interest blunted by routine, all too often of a purely statistical nature. No inconsiderable proportion of juvenile tuberculosis is due to the bovine bacillus and the primary case is to be sought for in the byre rather than in the home. The need at the moment would seem to be a clear statement on the contact problem, what constitutes a "contact," how long does he remain so, on what standard of positive diagnosis shall he be judged—radiogram, or intradermal tuberculin test, or stethoscope—which portion of the contact class is the most important to infants, school-children, or adolescents. These are not quibbles. All cases of tuberculosis are contacts. With the resources at our disposal concentration on the immediately urgent danger points are essential and we must know where they are. Separating out into one group those in whom definite house contact can be established and lumping all the rest with the general population has undoubtedly brought out statistically the importance of home infection, but we are inclined to think there is a danger of obscuring certain other issues such as bovine tuberculosis and factory and workshop infection.

Between the ages of 5 and 45 tuberculosis is still, as Dr. MacNalty puts it, the chief killing disease, and no one can contemplate the curves facing p. 7 without pausing to consider. We have much to congratulate ourselves upon, and the report, considered as an audit, is a document of great merit. But the closing of the account is not yet in sight.

[1] A Report on Tuberculosis, including an Examination of the Results of Sanatorium Treatment. By Arthur Salusbury MacNalty, M.A., M.D., F.R.C.P., Senior Medical Officer for Tuberculosis, Ministry of Health. Reports on Public Health and Medical Subjects: No. 64. H. M. Stationery Office. 1932. Pp. 172. 3s.

[2] See THE LANCET, 1929, i., 1201.

ST. JOHN'S HOSPITAL, TWICKENHAM.—Recently the Princess Royal opened new wards at St. John's Hospital, Twickenham, and unveiled two memorial tablets. The cost has been £6000, of which only £400 remains to be raised.

OBITUARY

THOMAS GEORGE STYAN, M.D. Camb.

THE death took place on March 13th at his residence in Sevenoaks of Dr. Thomas Styan, who practised before retirement at Ramsgate for some 40 years, and was one of the best known practitioners in the Isle of Thanet.

Thomas George Styan was educated at Uppingham and Trinity College, Cambridge, where he graduated in Arts in 1878. He proceeded to St. Bartholomew's Hospital, took the M.B. Cambridge in 1885, and held the appointment of house physician at the hospital. He later filled an appointment at the Salop Infirmary, took the M.D. degree in 1887, and in the following year succeeded to the practice in Ramsgate of Dr. Samuel Woodman. He made an immediate mark as a careful practitioner and a competent surgeon. He was appointed surgeon to the Ramsgate and St. Lawrence Royal Dispensary, and in 1889 to the Ramsgate General Hospital and Seamen's Infirmary; was medical officer of health to the borough and port of Ramsgate, and school medical officer, Ramsgate Education Committee.

During the war Dr. Styan gave valuable service. He was surgeon to the Kent 2 V.A.D. Auxiliary Military Hospital at Ramsgate from Oct. 10th, 1914. In the conversion of Nether Court Manor House into a hospital he advised as to providing extra wards and an operating theatre, and in general superintended the organisation. Up to Oct. 10th, 1917, 2073 patients passed through this hospital, the majority of which were acute surgical cases coming direct from France and requiring operation. This hospital was closed when the town was subjected to very severe bombing. Until the termination of the war great demands were made upon Dr. Styan's services by the local general hospital, which also received many military patients as well as victims from the constant air-raids. His name was brought before those in authority several times, because of this thorough and valuable work, while for his services in connexion with Belgian refugees and wounded soldiers he was decorated by the King of the Belgians and made an officer of the Order of St. John of Jerusalem.

Dr. Styan, who was 75 years of age, had been both at Uppingham and Cambridge a fine football player, and in 1878 was captain of the University association team.

HERBERT WILLIAM CUNINGHAM, M.D.R.U.I.

Dr. H. W. Cuningham, who died suddenly in his consulting room on Feb. 25th, was in his sixty-fourth year. He was educated at the Academical Institution, Londonderry, and took his medical course at the Queen's University of Belfast, graduating with distinction in the Royal University of Ireland in 1892. After acting as house physician in the Royal Hospital, Belfast, and obtaining some experience in England, he commenced practice in his native city of Londonderry, and took his M.D. in 1895. He was appointed medical officer to Londonderry No. 1 and Upper Liberties Dispensary District, a post he occupied for 33 years, and from which he was on the point of retiring. For 20 years he was honorary visiting physician to the Derry City and County Infirmary. He also acted as medical visitor in lunacy for the Lord Chief Justice of Northern Ireland. He was president of the Ulster branch of the British Medical Association in 1924, when he delivered a thoughtful and literary address on Nerve Exhaustion. During the war he carried out the duties of civil surgeon at the military barracks. He took a part in the social life of the city, being a governor of Foyle College and of the Londonderry High School. He was fond of music, and was one of the original founders of the Derry Philharmonic Society. The colleague, who sends us these details, writes of Dr. Cuningham's quiet dignity and charm of manner, his strict sense of honour, his warm heart and generous disposition, his professional skill and ready sympathy which made him beloved as a physician, not only in Londonderry, but among his colleagues throughout Ulster.

THE LATE LIEUT.-COL. J. H. REYNOLDS, V.C.

To the brief note on the adventurous career of Colonel Reynolds in our last issue Mr. W. G. Spencer, consulting surgeon to the Westminster Hospital, adds the following reminiscences: "Whilst Col. Reynolds was in charge of the Pimlico Clothing Department he was accustomed to send workwomen to me at the hospital, and later he came to me about his health, the last time at the beginning of 1929. Then a growth for which a grave operation would otherwise have been called for disappeared in about ten days under radium. Col. Reynolds was thus able to walk at the head of the V.C.'s at the thanksgiving ceremony, and to be present at the dinner in the House of Lords. Our conversations often returned to Rorke's Drift, and from notes I jotted down I pick out a few of his reminiscences which I have not noticed in the general story.

"There were 36 patients in hospital, most in different stages of typhoid fever. No preparations had been made for the defence of the station. Reynolds was the senior officer, having been already six years in South Africa; Bromhead and Chard were young subalterns, just out from England; Dalton was an Army non-com, who had rejoined, and had had experience in the methods of defence employed by the Boers, and when fugitives from Isandhlwana reached Rorke's Drift it was first proposed to evacuate the station, but Reynolds declared that to be impossible. Even if the convoy could cross the river the ascent of the opposite bank was so long and steep that the Zulus would certainly catch it up. It was Dalton who arranged the defence with mealie bags. When the Zulus came into view there appeared horsemen in scarlet, and the cry was that the cavalry were returning, but Reynolds pointed out that the riders were not rising in their saddles, but sat the horses as did natives. Coming nearer, the Zulu impi drew up and ceremoniously took snuff, heralding a charge to the uttermost. A few Zulus got into the garden and into the hospital before two patients in bed could be got within the lager; a third lost his head, took a wrong turning, and was killed. The remaining 33 cases were saved."

Mr. J. THEODORE CHURCHILL.—Mr. J. T. Churchill, senior partner in the well-known firm of Messrs. J. and A. Churchill, died suddenly at Matlock on March 11th. Mr. Churchill received part of his education in Berlin and part in Paris, and was thus

(*Continued at foot of opposite page.*)

PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS.

VETERINARY SURGEONS BILL.

IN the House of Commons on Friday, March 11th, the Veterinary Surgeons (Irish Free State Agreement) Bill, which has already passed through the House of Lords, passed through Committee and was read the third time.

DANGEROUS DRUGS BILL.

In the House of Commons on Monday, March 14th, Mr. OLIVER STANLEY (Under Secretary for Home Affairs) moved the second reading of the Dangerous Drugs Bill which has already passed through the House of Lords. He said the reason for the introduction of the Bill was to enable His Majesty's Government to ratify a Convention agreed to at Geneva last summer. This country had always been to the front in attempting to regulate the traffic in dangerous drugs. During last summer a largely attended conference was held at Geneva to discuss that question. The scheme for regulation which was proposed by His Majesty's Government was not accepted by the Conference and they were bound to point out that in their view the scheme which finally formed the basis of the Convention had a certain defect and would present difficulties in practice. But they acknowledged that the scheme was an advance on the present position, and they therefore became one of the signatories to the Convention. To enable this country to ratify that Convention it was necessary to make certain minor amendments of the existing law. To a large extent it would be possible to put the Convention into force under the existing Dangerous Drugs Act, but there were two main particulars in which it might be necessary to make an alteration. The first was in regard to certain derivatives of opium, which were not habit-forming drugs in themselves, but were capable of easily being converted into such. In accordance with the Convention it was necessary to take power to deal with them. The two drugs which were mainly concerned were commonly known as codeine and dionin, although they would probably be more familiar to hon. Members under their more scientific name as methylmorphine and ethylmorphine. The House would realise that those drugs were included together with their respective salts. They were not in themselves drugs medicinally, although they were capable of being converted into such drugs. They were drugs of a useful character which were more and more generally being used as a substitute for more dangerous drugs in medical preparations. Although it was necessary under the Convention to have some control over them they did not want to establish a control of such rigidity as would interfere with their proper purpose and use. They intended therefore under Subsection (3) of Clause 2 of the Bill to extend Part III. of the Dangerous Drugs Act, and to control the process of manufacture of those two drugs. It would be found that when they brought this control into force it would affect neither the retail trade nor the users of these drugs in medical preparations. He felt sure that it would not interfere in any way with legitimate trade in these drugs.

(*Continued from previous page.*)

a proficient French and German scholar. He was personally known to a very large number of the medical profession as a publisher and one of the proprietors of the Medical Directory. The firm started in 1825, and was concerned in several ways with the publication of THE LANCET in early days. It is now represented by Mr. A. W. Churchill, Mr. Theodore Churchill's cousin.

ANTICIPATING NEW DERIVATIVES.

The other alteration that had to be made was in regard to certain new derivatives of opium or the coca leaf which might be invented or discovered in years to come. Up to now they had not been able to deal with new inventions. The scheme as proposed under Clause 2 Subsections (1) and (2) of the Bill was as follows: First of all they would start with a complete ban on the trade or manufacture of any such new derivatives, and if it was found that any new invention of this kind was of medical or scientific value, the ban could be lifted. The next step was that this new-found drug should be submitted to the League of Nations for their report as to whether it was a drug of addiction, or a drug which was capable of being so converted. If it was found that this new drug had no medical or scientific value, then the ban would not be lifted. If it was found that the drug was of medical or scientific value then the ban would be lifted. If the League of Nations found that it was a drug of addiction then they could bring into operation Part III. of the principal Act. If they found that it was not a drug of addiction, but was capable of being converted into one, then they were entitled to use the same procedure as he had already detailed in the case of the other two drugs. Finally, this Bill was to be brought into operation by Order in Council. The necessity for that was that the Convention would not come into force until it was ratified by 25 of the signatories, including at least four of the main manufacturing countries, and it was necessary therefore to retain a discretion as to when it should come into force.

Mr. RHYS DAVIES said that as far as the opposition were concerned they gave their blessing to the Bill. It was a very necessary measure. Whenever the Government took an international line on any subject they were inclined to support them.

Sir WILFRID SUGDEN asked if the Bill had the assent of the veterinary surgeons, the British Medical Association, or the Society of Pharmacists of Great Britain and Ireland, the three bodies mainly interested in what was being done.

Mr. C. WILLIAMS warned the Government that although he accepted the Bill as a whole quite readily, when they reached the Committee stage he might wish to omit one or two of the words in Subsection (*g*) of Clause 1.

Mr. STANLEY said that the Convention which the Bill was intended to ratify had been laid before Parliament and formed the subject of a White Paper. In view of the fact that the Government had received no representations against it he thought they could conclude that the Bill was agreed to.

The Bill was read a second time and committed to a Committee of the whole House.

KETTERING GAS BILL.

On Monday, March 14th, the House of Commons debated the Kettering Gas Bill on second reading. The Bill, which is a private measure, raises a principle of some importance both locally and nationally. The Preamble states that the Kettering Urban District Council is authorised to supply electricity for public and private purposes, and is also developing certain housing estates within its area. It adds that the tenants of the houses on one of the estates are precluded from obtaining a supply of gas for any purposes other than certain specified purposes, and that the tenants on the remaining estates have been prevented from obtaining a supply of gas for any purpose. The object of the Bill is to prevent the Council imposing restrictions with respect to the form of light, heat, power, or energy supplied to any property for the time being belonging or leased to them.

In the course of the debate it was strongly urged by several Members that the citizens should have the

right to choose whether they would have gas or electricity in their houses.

Dr. HOWITT said he regarded it as entirely wrong to grant to any council the power to force either gas or electricity upon its tenants, and not to allow them the choice of having either or both. There were in this country at present too many laws restricting the liberty of the individual. If this Bill was not passed the poorer tenants in these council houses at Kettering would not be able to afford electric light, and would have to use candles and oil lamps. He spoke as a doctor who had spent many years of his life in Lambeth, working under conditions such as that, and it was very difficult indeed for a medical man to attend adequately to any patient in distress under such conditions. He had been told that in certain council houses in this country doctors who had been called to confinement cases had to carry on their work by the spluttering light of a candle. That was a monstrous thing to happen in these days. He urged the House to give the Bill a second reading.

Mr. ERNEST BROWN (Parliamentary Secretary to the Ministry of Health) said that the Minister of Health had given this matter very careful consideration, and it was his clear opinion that this Bill should go to a Committee of the House where the issues could be thrashed out.

The Bill was read a second time.

HOUSE OF COMMONS.

WEDNESDAY, MARCH 9TH.

Increase in Mental Deficiency.

Sir JOHN BIRCHALL asked the Minister of Health whether he had considered the resolution sent to him by the Leeds City Council in reference to the increase in mentally deficient persons and advocating a measure to prevent the procreation of children by mentally deficient persons; and whether he proposed to take any steps in the direction indicated.—Mr. E. BROWN (Parliamentary Secretary to the Ministry of Health) replied: Yes, Sir. As indicated in my reply to a question on Feb. 15th, my right hon. friend is arranging for certain preliminary investigations as a first step towards a general inquiry into this problem.

Tin Foil Wrapping.

Mr. THORNE asked the Minister of Health the number of poisoning cases which had been proved to be attributable to foodstuffs wrapped in tin or lead foil; and whether he would consider the advisability of issuing an order for the immediate wrapping of foodstuffs to be either grease-proof or cellophane.—Mr. ERNEST BROWN replied: Apart from one unverified case in which poisoning was suggested, my right hon. friend has no information that wrappers of tin or lead foil have been the cause of food poisoning. In these circumstances, he would not be justified in making such an order as is suggested.

Tuberculosis in Glasgow Area.

Mr. MCGOVERN asked the Secretary of State for Scotland the number of persons from the Glasgow area who were at present certified as suffering from tuberculosis; the number in institutions; the names of the institutions concerned; and the ages of the persons.—Sir ARCHIBALD SINCLAIR replied: The number of persons in Glasgow who were known to be suffering from tuberculosis on the 3rd instant was 9675. The number of Glasgow tuberculosis patients in institutions on that date was 1714 and the names of the institutions in which these patients were resident are as follows: Ruchill Hospital, Knightswood Hospital, Robroyston Hospital, Bellefield Sanatorium, Mearnskirk Hospital, Darnley Hospital, Ochil Hills Sanatorium, Bridge of Weir Sanatorium, Dunblane Sanatorium, Lanfine Homes, Stobhill Hospital, Barnhill Hospital, Eastern District Hospital, Oakbank Hospital, Merryflats Hospital, Hairmyres Sanatorium, and Strathblane Children's Hospital. The patients in question are of all ages, and to classify them according to age would involve an amount of labour out of proportion to the value of the result.

Hypodermic Syringes for Panel Patients.

Mr. LOGAN asked the Minister of Health if he was prepared to include in the second schedule to the National Health Insurance Consolidated Regulations hypodermic syringes and needles, so that insured patients might use them for asthma self-treatment, when prescribed.—Sir E. HILTON YOUNG replied: As the result of a recent discussion of this matter by my department with representatives of doctors in insurance practice, I am not satisfied that there are any sufficient reasons for making these appliances available as part of medical benefit.

THURSDAY, MARCH 10TH.

Experiments on a Monkey.

Mr. HOPKIN MORRIS asked the Home Secretary if his attention had been called to experiments performed upon a monkey, denominated for the purposes of the experiments monkey 420, involving severe and enduring pain; and whether in this case the animal was forthwith painlessly destroyed.—Sir HERBERT SAMUEL replied: I presume that the hon. Member is referring to the experiments performed in the course of the investigation into an outbreak of rabies in Trinidad an account of which was published in THE LANCET of Sept. 19th last. I am advised that the symptoms recorded in the report of the experiments were mental in character due to the injections, and that there is no reason to suppose that the animal was suffering severe pain which was likely to endure.

Mr. MORRIS: Is the right hon. gentleman aware that in the article describing this experiment it is stated that the animal was kept alive for a period of ten days?

Sir H. SAMUEL: No, Sir. I was unaware that it was ten days, but that does not affect the answer I have given.

Scientific Analysis and Criminal Investigation.

Mr. CROSS asked the Home Secretary whether in view of the high cost of fees paid to analysts and others by the metropolitan police, he would give instructions for all examinations of garments and other specimens to be carried out by the scientific branch of the Criminal Investigation Department at Scotland Yard in all cases which could be dealt with by means of ordinary scientific apparatus.—Sir HERBERT SAMUEL replied: The total cost of such fees in any one year is not high, the average for the last three years being less than £100 a year. Where expert evidence on scientific matters is in question, it is better that it should be given by independent witnesses free upon occasion to give evidence either for a prosecution or for a defence and not regularly employed to give evidence for the police only.

Sexual Offences against Young Children.

Viscountess ASTOR asked the Home Secretary whether he was aware that sexual offences against children under 16 were increasing; that the five-year average for indecent assaults against them was the highest recorded for over 30 years; and what steps he proposed to take to check these offences.—Sir HERBERT SAMUEL replied: The figures of offences of defiling girls under 13 show a decrease, but those respecting girls from 13 to 16 an increase. There is reason to believe that the statistics are affected by a greater readiness on the part of relatives and friends to report offences to the police instead of concealing them. I would add that the number of persons proceeded against also shows an appreciable increase.

Viscountess ASTOR: Does not the right hon. gentleman think that it would be wise to increase the number of our women police, because many parents will report to women when they will not report to men, and is he aware that a committee set up to look into sexual offences recommended that we should have more women police?

Sir H. SAMUEL: It is possible, and indeed probable that offences are more readily reported in some cases to women police, but a very large increase in the number of women police might not succeed in stopping the actual offences themselves.

Mr. BRIANT asked the Home Secretary if he could give a statement showing the number of complaints made to the police during each of the years 1926–31 of sexual offences against young persons; and the number of persons charged with these offences during the same period.—Sir HERBERT SAMUEL replied: The following are the numbers of (A) offences known to police and (B) persons proceeded against in Courts of Summary Jurisdiction for certain sexual offences during the years 1926 to 1930.

—	1926.		1927.		1928.		1929.		1930.	
	A.	B.	A.	B.	A.	B.	A.	B.	A.	B.
Defilement of girls—										
Under 13	86	64	91	65	73	59	76	61	58	38
Under 16	223	185	279	218	275	218	346	259	402	304
Attempts to commit unnatural offences—										
Indecent assaults on males under 16 ..	†	125	†	167	†	162	†	162	†	165
Indecent assaults on females under 16 ..	†	969	†	933	†	939	†	949	†	891

† = Numbers not available.

Water-supplies in Rural Areas.

Mr. ROSBOTHAM asked the Minister of Health if his attention had been drawn to the fact that many rural parishes were in need of public water-supplies; and if he would consider taking steps as early as possible to make special grants to rural district councils to enable them to remedy the conditions under which many of the inhabitants obtained their daily supplies.—Sir E. HILTON YOUNG replied: I am aware of the inadequacy of the water-supply in some rural parishes. Conditions generally have improved in recent years, loans amounting to £2,000,000 in respect of rural schems having been sanctioned by my department during the last three years. As regards the second part of the question, I cannot hold out any hope of special assistance being available from the Exchequer, but I may point out that it is open to county councils to contribute to the cost of schemes.

Vaccination and Encephalitis.

Mr. GROVES asked the Minister of Health whether any changes had been made in the methods of manufacturing vaccine lymph in the Government lymph establishment, with a view to the prevention of the risk of post-vaccinal encephalitis; and whether the changes, if any, included the abandonment of the use of rabbits for the purpose of strengthening the lymph supplies.—Sir E. HILTON YOUNG replied: This question has been fully considered, and no such change has been made or is contemplated. I am advised that there is no evidence to suggest that the use of rabbits in the preparation of lymph has any influence on the occurrence of post-vaccinal encephalitis.

League of Nations and Statistics of Small-pox.

Mr. GROVES asked the Minister of Health whether he would consider the advisability of making representations to the League of Nations health committee in regard to the way in which statistics of small-pox cases were set forth in their periodical Reports, in view of the fact that no discrimination was made in the Reports between the mild and almost non-fatal variety of small-pox, known as alastrim, which had been recently prevalent in England, and the severe or classical type which was prevalent for the most part elsewhere.—Sir E. HILTON YOUNG replied: Distinctions between the two varieties of small-pox appear in the latest of these Reports which deal with epidemics of this disease. The Reports are issued solely on the responsibility of the Health section of the Secretariat of the League of Nations. It is specifically stated in each Report that the responsibility of the Health Committee of the League is not involved.

Dead Bodies Recovered from the Thames.

Mr. COCKS asked the Home Secretary how many dead bodies were taken from the Thames for the year ended Feb. 29th, 1932; and what were the verdicts recorded at the inquests.—Sir HERBERT SAMUEL replied: I can only give figures for the City of London and Metropolitan police district, as follows. The number of bodies was 158 and the verdicts at the inquests were: found drowned and open verdict, 56; suicide, 46; accident or misadventure, 39; stillborn or want of attention at birth, 15; murder (newly-born), 1; cause not known, 1.

Murder Statistics for England and Wales.

Mr. COCKS asked the Home Secretary if he would state how many murders were known to the police in England and Wales during the years 1930 and 1931, respectively; in how many cases the supposed murderer committed suicide; how many persons were proceeded against for murder; how many of such persons were found to be insane before trial or on arraignment, or guilty but insane; how many of such persons were convicted of murder excluding those found guilty but insane; and how many of those convicted of murder were subsequently executed.—Sir HERBERT SAMUEL replied: The full details desired are not yet available for 1931. In 1930, 108 murders were known to the police, involving 119 victims, of whom 22 were newly-born infants whose bodies were found in such circumstances as to afford no clues enabling arrests to be made. Thirty-six suspects committed suicide; 41 were proceeded against; 17 were found to be insane; 14 were convicted and sentenced to death, the sentence being executed on six of them.

MONDAY, MARCH 14TH.

Milk-supply and Public Health.

Captain ELLISTON asked the Minister of Agriculture whether, in view of the connexion of the milk-supply with various aspects of health and the prevention of disease, representation would be given to the public health interests on the commission for the reorganisation of the milk industry.—Sir JOHN GILMOUR replied: I regret I cannot undertake to give representation on the commission to any particular interest, but I will, however, bear my hon. friend's suggestion in mind.

Remedies for Pulmonary Phthisis.

Mr. MANDER asked the Minister of Health whether he was aware of the cures effected in cases of pulmonary phthisis by the British remedy Umckaloabo; and whether he would give instructions for this fact to be officially brought to the notice of medical officers in official appointments concerned with this disease.—Sir E. HILTON YOUNG replied: The evidence available in regard to the efficacy of this preparation has been carefully considered on several occasions. I am advised that the claims made on its behalf in regard to tuberculosis do not appear to differ in character or degree from those made for many other so-called "remedies" which have been advertised from time to time and afterwards found to be valueless. The answer to the second part of the question is in the negative.

Sickness among Women Workers.

Mr. LOUIS SMITH asked the Minister of Health whether his attention had been called to the increase of sickness among women workers coming under the national health insurance scheme, and especially married women; and whether he could give any accepted explanation of such increase.—Sir E. HILTON YOUNG replied: I am aware of the increase that has taken place in the claims of insured women workers, and particularly married women, to sickness and disablement benefit, as compared with the experience of some years ago. It is not possible to give a specific explanation of this increase, which is believed to be the combined result of a number of causes acting together. The whole subject of women's insurance is at present engaging my attention.

Fatal Railway and Road Accidents.

Mr. SOMERVELL asked the Home Secretary how many persons had been killed in railway accidents and road accidents, respectively, in the last five years.—Sir H. SAMUEL replied: The number of persons killed in Great Britain in railway and road accidents respectively during the years since 1926 were as follows:—

	1926.	*1927.*	*1928.*	*1929.*	*1930.*	*Total.*
Railway ..	374	435	460	417	380	2,066
Road ..	4886	5329	6138	6696	7305	30,354

For 1931 the figures of railway accidents are not yet available; the number of road accidents was 6690.

TUESDAY, MARCH 15TH.

Provision of Meals for School-children.

Mr. JOEL asked the President of the Board of Education whether the estimate for special services in connexion with elementary education outlay showed any increase in the provision of meals for children; and whether he was satisfied that this requirement was adequately met.—Mr. RAMSBOTHAM (Parliamentary Secretary to the Board of Education) replied: In the Board's estimates for 1932 allowance is made for increased expenditure by local education authorities on the provision of meals to the extent of £20,000, as shown on page 12 of the Estimates Memorandum (Cmd. 4031). It is not possible to forecast the actual expenditure to be incurred on this service, but my right hon. friend is satisfied that, so far as can at present be ascertained, the estimate is adequate for any probable requirements.

Medical and Dental Officers in the Navy.

Mr. PRICE asked the First Lord of the Admiralty whether the number of medical and dental officers was up to the establishment, as no provision was made for examinations for entry in the Estimates for 1932.—Lord STANLEY (Parliamentary Secretary to the Admiralty) replied: The establishment of naval medical officers is not complete, there being a deficiency of approximately 60. The entrance examination is at present in abeyance, and entries are being made for short service by selection after interview. The number of dental officers is one short of establishment. When the number of vacancies does not justify the holding of a competitive examination, entries are made by selection after interview in the same manner as for the entry of medical officers for short service.

A "LEWIS CARROLL WARD."—It is proposed to endow a ward for children at St. Mary's Hospital, W.2, as a tribute to the author of "Alice in Wonderland" at a minimum cost of £10,000. The scheme is supported by the Prime Minister, Mr. Stanley Baldwin, Mrs. Hargreaves (the original "Alice"), Sir J. M. Barrie, and other distinguished persons.

MEDICAL NEWS

University of Cambridge.

On March 12th the following degrees were conferred:—

M.D.—A. W. C. Miller.
M.S.—M. F. Nicholls.
M.B. & B.Chir.—W. Radcliffe and G. H. Sanderson.

Diploma in Medical Radiology and Electrology.—The Committee for Medical Radiology and Electrology have approved the theses of the following: Probodh Chandra Basu, Samuel Bradbury, Hugh William Davies, (Mrs.) Elfrida Lilian Gwendolen Hilton.

Royal College of Surgeons of England.

A meeting of the Council was held on March 10th with Lord Moynihan, the President, in the chair. Lord Dawson, President of the Royal College of Physicians of London, and Sir Henry Wellcome, founder of the Wellcome Research Institution, were elected honorary Fellows of the College.—Mr. Francis James Steward, surgeon to Guy's Hospital, was elected the representative of the College on the General Medical Council.—It was reported that the Mackenzie Mackinnon research fellowships of Dr. G. Scott Williamson and Dr. T. C. Hunt had been renewed for another year.

Diplomas in ophthalmic medicine and surgery were granted jointly with the Royal College of Physicians to 12 candidates. Licences in dental surgery were granted to the following candidates who were successful at the February examination:—

Noreen M. Coghlan, L. H. E. Croxford, J. H. De Mierre, B. W. Fickling, J. C. Fry, K. C. Gebbie, S. S. Gill, H. D. Goldin, G. G. Hardie, F. H. Harris, A. W. Holroan, C. W. Holmden, R. S. Jenkins, L. C. Lavender, Brendan Law, E. H. Lewis, H. A. Madkour, C. C. R. Mailer, K. C. Moss, Leslie Myers, L. P. Nutton, Hilda M. Osborne, J. F. Partridge, G. E. Paxon, S. R. Peatfield, Joan W. Phillips, M. W. Pilcher, Sidney Puckey, Trilochan Singh, L. H. Smith, C. R. Stone, J. L. Torkington, U. L. W. Whitling, and E. V. B. Widdowson.

South-West London Medical Society.

A meeting will be held on March 23rd at the Bolingbroke Hospital, Wandsworth Common, at 9 P.M., when a discussion on Acute Abdominal Pain will be opened by Mr. Norman Lake and Dr. C. E. Lakin.

Royal Navy Medical Club.

The annual dinner will be held at the Trocadero Restaurant on Thursday, March 31st, at 8 P.M., following a general meeting at 7.30 P.M. Particulars can be obtained from the hon. secretary, Surgeon-Commander R. J. G. Parnell, R.N., Medical Department, Admiralty, S.W. 1.

Huddersfield Royal Infirmary Extensions.

The Duke of York on March 12th laid the foundation-stone of extensions to Huddersfield Royal Infirmary which are being erected at a cost of approximately £75,000. The Duke said that the new building promised to be one of the finest hospital buildings in the country.

American Congress of Physical Therapy.

This Congress, it is announced, will meet in New York City on Sept. 6th, 7th, 8th, and 9th, 1932. The meeting will be held in conjunction with local medical societies and will aim at presenting the latest advances in clinical work and research in the line of physical therapy. The British representative at the Congress will be Dr. F. Howard Humphris.

University of London Medical Graduates Society.

The fifth annual dinner will be held on May 11th at the Langham Hotel. The Chancellor of the University will attend and Sir John Rose Bradford will preside. Particulars of the society, membership of which is open to all medical graduates of the university, can be obtained from the hon. secretaries, 11, Chandos-street, Cavendish-square, W.1.

Chadwick Public Lectures.

The March lecture was held on Tuesday last when Mr. C. Ernest Elcock, F.R.I.B.A., spoke on Modern Hospital Planning and Construction. One of the April lectures will be held in Paris at the Faculty of Medicine where Sir Humphry Rolleston will give an address on the Pioneers and Progress of Preventive Medicine. On April 28th, at B.M.A. House, Dr. James H. Sequeira will speak on the Educational Aspect of Public Health Work in the Tropics. Sir Ernest Graham-Little will give the Malcolm Morris Memorial Lecture entitled Dermatology as an Outpost of Medicine at the house of the Royal Society of Arts on May 23rd. The concluding lecture will be delivered on June 9th by Dame Helen Gwynne Vaughan at the Chelsea Physic Garden, and will be on the Contribution of Plants to the Study of Heredity. Admission is free to all these lectures.

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MONDAY, March 21st.—8 P.M., ODONTOLOGY. Casual Communications: Mr. G. B. Pritchard and Mr. H. H. Kenshole: A Composite Odontome. Mr. J. Draper Cambrook: A Case of Two Buried Molars. Paper: Mr. J. G. Turner: Some Clinical Observations bearing on the Production of Deformities of the Dental Arch.

The Society's house and Library will be closed from Thursday, March 24th to Tuesday, March 29th, both days inclusive.

HUNTERIAN SOCIETY.

MONDAY, March 21st.—7.15 P.M. (at Simpson's Restaurant, 2 and 3, Bird-in-Hand-court, 76, Cheapside): Dinner Meeting. Discussion on the Evolution of the Municipal Hospital, to be opened by Dr. W. Brander.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W.1.

MONDAY, March 21st.—8.30 P.M., Discussion on The Diagnosis of Diseases of the Hip-joint, to be introduced by Dr. J. F. Brailsford.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith, W.

MONDAY, March 21st.—10 A.M. to 1 P.M., Gynæcological Ward Visit. Genito-urinary Operations, Skin Department. Surgical Ward Visit. 2 P.M. to 4 P.M., Operations, Surgical Ward Visit. Medical, Surgical, Eye, and Gynæcological Out-patients.

TUESDAY.—10 A.M. to 1 P.M., Medical Ward Demonstration. Dental Department, Throat Operations. Surgical Demonstration. 2 P.M. to 4 P.M., Operations. Medical, Surgical, and Throat, Nose and Ear Out-patients.

WEDNESDAY.—10 A.M. to 1 P.M., Medical Ward Visit. Children's Medical Out-patients. 2 P.M. to 4 P.M., Gynæcological Operations. Medical, Surgical, and Eye Out-patients. 4.45 P.M., Venereal Diseases Demonstration.

THURSDAY.—10 A.M. to 1 P.M., Neurological Out-patients, Fracture Demonstration. 2 P.M. to 4 P.M., Operations, Genito-urinary, Medical, Surgical, and Eye Out-patients.

CHARING CROSS HOSPITAL MEDICAL SCHOOL.

SUNDAY, March 20th.—10.45 A.M., Dr. E. C. Warner: Causes and Treatment of Chronic Diarrhœa. 11.45 A.M., Mr. J. B. Banister: Causes and Treatment of Dysmenorrhœa.

ROYAL NORTHERN GROUP OF HOSPITALS, Holloway road, N.

WEDNESDAY, March 23rd.—3.15 P.M. (at the Royal Chest Hospital), Dr. J. Maxwell: Recent Advances in Asthma.

HOSPITAL FOR EPILEPSY AND PARALYSIS, Maida Vale, W.

THURSDAY, March 24th.—3 P.M., Dr. F. L. Golla: Clinical Demonstration for Medical Practitioners.

ST. JOHN'S HOSPITAL DERMATOLOGICAL SOCIETY.

WEDNESDAY, March 23rd.—4.15 P.M. (at St. John's Hospital, 49, Leicester-square, W.C.), Clinical Cases 5 P.M., Dr. J. T. Ingram: Idiosyncrasy in Relation to Dye Dermatitis.

HAMPSTEAD GENERAL AND NORTH-WEST LONDON HOSPITAL.

WEDNESDAY, March 23rd.—4 P.M., Dr. H. M. Oddy: Chronic Arthritis.

MANCHESTER ROYAL INFIRMARY.

TUESDAY, March 22nd.—4.15 P.M., Mr. C. Roberts: Comfortable Convalescence.

ROYAL INFIRMARY, Glasgow.

WEDNESDAY, March 23rd.—4.15 P.M., Dr. J. F. Smith: Skin Cases.

PAYMENTS FOR DISTRICT NURSING. — At the annual meeting last week of the North London (Islington) District Nursing Association, it was stated that last year 55,826 visits were paid to the sick by the Association's nurses. These ministrations have for more than half a century been free, but last year, in view of the financial situation, it was decided to place the Association on a basis of voluntary contributions from patients able to pay. Payments for visits vary from nil to 5s., the amount being assessed by the doctor according to the patient's ability to pay.

NOTES, COMMENTS, AND ABSTRACTS

THE MEDICAL REGISTER.

THE Medical Register for 1932, a copy of which we have just received from the Registrar of the General Medical Council, contains the names and addresses of 55,604 persons entitled to practise medicine and surgery under the Medical Acts of 1858 and 1886, an increase of 313 over the number of names in the previous year. During the 12 months 770 names were added by registration in England, 388 in Scotland, 168 in Ireland, 188 to the Colonial List, and 8 names to the Foreign List—1522 in all. During the same period 1264 names were removed from the Register, 924 on evidence of death, 6 as the result of disciplinary action by the General Medical Council, and 334 who failed to respond when desired to do so by registered letter. Fifty-five names were restored to the Register during the year. The only blot on the convenience of the Register as a work of reference is the separation from the body of the Register of the Colonial and Foreign Lists, the persons named in which have precisely the same privileges and obligations as those in the main list. As far at all events as the Colonial List is concerned this segregation has long become an anachronism. It would, however, require legislation to amend Clause 14 of the Act of 1886.

The Dentists Register for 1932 contains 14,472 names, or 50 more than in the previous year. Of the 14,391 names in the United Kingdom section 7041 are those of graduates or licentiates in dental surgery.

THE LONDON COUNTY COUNCIL NURSING SERVICE.

AT a meeting of the London County Council held on March 8th a report from the Central Public Health Committee was adopted, in which the opinion was recorded that in cases in which it is possible to increase the nursing staff accommodation in the Council's hospitals it would be more economical to do so than to have a large proportion of the nursing staff non-resident. On the other hand, non-resident staff must continue to be engaged for those hospitals where there are at present no available facilities for extension of nursing staff accommodation without incurring large expenditure, and for hospitals where, unless non-resident officers are engaged, the nursing care and treatment of the patients would inevitably fall below the desired standard. The committee added that it would appear to be definitely undesirable to engage probationer nurses in training as non-resident officers until such time as it is possible to eliminate much of the theoretical study and requisite junior examinations from the period of practical training, and, in this respect, to place first year probationers on the same basis as first year medical students. They referred to the recent issue of the final report of THE LANCET Commission on Nursing, and proposed to give careful consideration to the recommendations and suggestions in the Commission's report, so far as they are applicable to conditions in the Council's hospital nursing service.

L.C.C. AND TRAINING OF NURSES.

Dr. E. Rickards, commenting on the Central Public Health Committee's views, said there would be a further opportunity of discussing the whole question when a report was before the Council on the conclusion and recommendations of THE LANCET Commission on Nursing. There was at present no shortage of nurses in hospitals under the control of the L.C.C. The number of applications exceeded the vacancies, and the service which the Council had inaugurated was a complete service for all those who wished to take up nursing, and offered opportunities which had never been offered before. The scheme provided for permanent appointments, good conditions of service, holidays with pay, and a pension scheme. She held no brief for the principle of a non-resident staff, but did not consider that an eight-hour shift was unsuitable for nurses or had serious disadvantages. It might in some cases be impracticable, but in any case a 56-hour week, with one day off, was too long for a nurse to work. A 48-hour week was the ideal to be aimed at. She was not completely satisfied with the discipline to which nurses were subjected in their off-duty time. A nurse in a Nurses' Home did not enjoy the same freedom as a teacher or a clerk, and that was one reason why there had been disinclination to take up the nursing profession. If Nurses' Homes could be converted into hostels, managed by the nurses "pretty much on their own lines," with a certain amount of discipline imposed by a committee of their own choice, the ideal of a suitable residence would be much nearer to attainment. Dr. Barrie Lambert (Chairman of the Public Health Committee) said that where the 48-hour scheme had been tried it had created extraordinary difficulties from the patients' point of view, as also from the point of view of the training of the nurses. In her opinion, a 54-hour week was not excessive. On the question of discipline in the Nurses' Homes she agreed with Dr. Rickards. Discipline in the wards should not be relaxed, but all possible freedom should be granted in the Nurses' Homes. The Council had already made great strides in that direction, but it was still true that where a number of young girls lived together there must be some form of discipline. She assured the Council that the utmost relaxation would be given to nurses, so that they might have as good a time as possible when off duty.

A NEW APPARATUS FOR ADMINISTERING CO_2.

THE value of carbon dioxide as a stimulant to the respiratory centre has only been recognised and acted upon within recent years. At the present time it is frequently employed to combat failing respiration, particularly in anæsthetic emergencies, and when the condition arises in mining, or from inhalation of domestic gas. Therefore we welcome an apparatus of simple design and convenient bulk which allows the administration of a regulated percentage of the gas. Less bulky devices in common use are, of course, extraordinarily convenient to handle, but have the disadvantage that the volume or percentage of CO_2 delivered cannot be accurately estimated, and the possibility of overdosage must not be overlooked, when the apparatus is used, as it may have to be, by inexperienced persons. This danger does not arise in connexion with the Carbetha Apparatus put on the market by Siebe, Gorman and Co., which was designed at the suggestion of Prof. J. S. Haldane, F.R.S. Two models are provided differing only in the size of the CO_2 cylinder, which may be ½ lb. or 2 lb. The percentage of carbon dioxide in the mixture of this gas and air provided varies between 3% and 7%, and is indicated on a calibrated dial.

AN IMPROVED CORSET BELT.

THE discomfort of wearing a surgical belt under an ordinary corset is sometimes complained of by patients who have been ordered the former. We have had brought to our notice some recent improvements in a corset belt which is designed for the purpose of giving support in cases of visceroptosis, especially where one or other kidney requires special support. These features include specially designed straps which cross at the back and buckle in front, and a deep pad which is so shaped as to keep the kidney in place. Bones, which are essential in such a belt, are tapered off at the top to prevent pressure. This

corset belt, which is made to the measurements of each patient and fitted by Madame Rose, 97, Mortimer-street, London, W.1, has the outward appearance of and indeed may take the place of an ordinary corset. The only suggestion we might offer for still further improvement is that the pad, which is at present covered with chamois leather, should have an outer detachable covering of very thin rubberised material so that its surface can be easily washed. Satisfactory reports have been received by us from physicians who have ordered this belt for their patients.

Appointments

BEAL, J. R., M.D., Ch.B., D.P.H., has been appointed Clinical Tuberculosis Officer for Sunderland.

EDGE, F., M.D. Lond., F.R.C.S. Eng., Medical Referee under the Workmen's Compensation Act for Wolverhampton County Court District.

Surgeons under the Factory and Workshop Acts: BOURKE, I. M., F.R.C.S. Edin., D.P.H. (Falmouth); KERR, J., M.B., Ch.B. St. And. (Bexhill); THOMSON, M. L. M., (Hoddesdon, Hertford).

LONDON COUNTY COUNCIL: NORRIS, T. St. M., M.B., B.Chir. Camb., Assistant Medical Officer, North-Eastern Hospital; MCMENEMEY, W. H., M.B., B.Ch., House Physician, North-Western Hospital; MILLOY, J. McN., M.B., Ch.B., Deputy Medical Superintendent, St. Andrew's Hospital; PRICE, I., M.B., B.S. Lond., F.R.C.S. Eng., Deputy Medical Superintendent, Bethnal Green Hospital; JOHNSTONE, J. G., M.B., Ch.B. Aberd., Medical Superintendent, Princess Mary's Hospital for Children, Margate; Hodson, H. B., M.B., B.S., Assistant Medical Officer, Grove Park Hospital; STEVENSON, R. S., M.B., Ch.B., M.D. Edin., Consulting Laryngologist at certain Special Hospitals; BLACKLEE, E. T., M.R.C.S., L.R.C.P. Lond., House Physician, Lewisham Hospital.

Vacancies

For further information refer to the advertisement columns.

Altrincham General Hospital.—Jun. H.S. At rate of £120.
Babies Club, Chelsea.—Asst. M.O.
Barnsley, Beckett Hospital and Dispensary.—H.P. £200.
Bath, Royal Mineral Water Hospital.—Physician.
Belgrave Hospital for Children, 1, Clapham-road, S.W.—Two H.P.'s and One H.S. Each at rate of £100.
Birmingham City Mental Hospital.—Med. Supt. £625.
Blackburn County Borough.—Res. Asst. M.O. and Jun. Asst. M.O. £350 and £150 respectively.
Bolton Infirmary and Dispensary.—H.P. £150.
Brighton County Borough Sanatorium and Infectious Diseases Hospital.—Jun. Res. M.O. At rate of £150.
Brighton, Royal Sussex County Hospital.—Hon. Clin. Asst. for Ophth. Dept.
Bristol Dispensary.—M.O.
Burton-on-Trent General Infirmary.—Jun. H.S. £150.
Canterbury, Kent and Canterbury Hospital.—H.P. At rate of £125.
Cardiff, Glan Ely Hospital, Fairwater.—Third Asst. Res. M.O. £250.
Cardiff, Prince of Wales Hospital for Limbless and Crippled.—Locum Tenens, Res. Surgeon. 4 gns. a week.
Charing Cross Hospital, W.C.—Res. M.O. £350.
Chelmsford Borough.—M.O.H. and School M.O. £800.
Coventry, Coventry and Warwickshire Hospital.—Hon. Asst. Pathologist.
Croydon General Hospital.—Cas. H.S. £125.
Doncaster Royal Infirmary.—Sen. Cas. H.S. At rate of £175
Dover, Royal Victoria Hospital.—Res. M.O. £180.
Durham County Hospital.—Two H.S.'s. Each £150.
Edinburgh Royal Hospital for Mental and Nervous Disorders.—Asst. Physician. £300.
Exeter, Royal Devon and Exeter Hospital.—H.S. to Special Depts. At rate of £150.
Freemason's Hospital and Nursing Home, 237, Fulham-road, Chelsea, S.W.—Surgeon Dentist.
Gloucester, Gloucestershire Royal Infirmary, &c.—Surgeon.
Guildford, Royal Surrey County Hospital.—H.S. £150.
Hereford, Herefordshire General Hospital.—H.P. At rate of £150.
Hospital for Sick Children, Great Ormond-street, W.C.—H.P. and H.S. Each at rate of £100.
Ilford, King George Hospital.—Cas. H.S. At rate of £100.
Ipswich, East Suffolk and Ipswich Hospital.—H.S. and H.P. Each £120.
Lancaster County Mental Hospital.—Asst. M.O. £500.
Lincoln, Bracebridge Mental Hospital.—Second Asst. M.O. £425.
Liverpool, Bootle General Hospital.—H.S. At rate of £150.
Liverpool, Mill-road Infirmary.—Res. Asst. M.O. £200.
Liverpool Royal Children's Hospital.—Res. H.S. At rate of £100.
L.C.C.—Res. Asst. M.O.'s for Various Institutions. Each £250. Also Res. Asst. M.O. for Hammersmith Hospital, Ducane-road, W. £350. Also Visiting M.O. for Edmonton Colony, Edmonton, N. £200.
London Lock Hospital, 91, Dean-street, W.—H.S. for Male Lock Hospital. At rate of £175.
Maidstone, Kent County Ophthalmic and Aural Hospital.—H.S. to Ear, Nose, and Throat Dept. At rate of £200.
Manchester Royal Eye Hospital.—Jun. H.S. £120.
Manchester Royal Infirmary, Central Branch, Roby-street.—H.S. At rate of £100.
Manchester Royal Infirmary.—H.S. £50.
Metropolitan Hospital, Kingsland-road, E.—Sen. and Jun. H.P.'s and H.S.'s. Also 2 Cas. O.'s. Each at rate of £100.
Middlesbrough, Holgate Municipal Hospital.—Jun. Res. M.O. At rate of £160.
Miller General Hospital, Greenwich-road, S.E.—Hon. Orthopædic Surgeon.
National Temperance Hospital, Hampstead-road, N.W.—Surg. Reg. 40 gns.
Northwood, Mount Vernon Hospital.—Res. M.O. £250.
Princess Beatrice Hospital, Richmond-road, Earl's-court, S.W.—Surgeon to Throat, Nose and Ear Dept., Physician to Out-patients' Dept.
Queen's Hospital for Children, Hackney-road, E.—Surgeon to Ear, Nose, and Throat Dept.
Queen's Institute of District Nursing, 58, Victoria-street, S.W.—General Supt.
Rochdale Infirmary and Dispensary.—Jun. H.S. £200.
Royal London Ophthalmic Hospital, City-road, E.C.—Sen. Res. O. At rate of £150.
Royal Naval Medical Service.—Vacancies.
Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—Cas. O. for Out-patient Department and H.S. At rate of £200 and £100 respectively.
St. Helens Hospital.—H.S. £200.
St. Paul's Hospital for Diseases of the Genito-Urinary Organs and Skin, Endell-street, Holborn, W.C.—H.S. At rate of £150.
Samaritan Free Hospital for Women, Marylebone-road, N.W.—Anæsthetist.
Stoke-on-Trent, North Staffordshire Royal Infirmary.—H.S. £150.
Taunton, Taunton and Somerset Hospital.—Sen. House M.O. and H.S. At rate of £150 and £100 respectively.
Victoria Hospital for Children, Tite-street, Chelsea, S.W.—Dental Surgeon.
West London Hospital, Hammersmith-road, W.—Hon. Med. Radiologist.

The Chief Inspector of Factories announces vacant appointments for Certifying Factory Surgeons at Burnley (North) (Lancs.), Newmarket (Suffolk), and Woburn Sands (Beds.).

Births, Marriages, and Deaths

BIRTHS.

GREY.—On March 9th, at Sloane-street, S.W., the wife of Dr. J. C. P. Grey, Malayan Medical Service, of a daughter.
ROLSTON.—On March 8th, at Crofts, Haslemere, the wife of Dr. G. R. Rolston, of a son.
STILL.—On March 8th, at Bareilly, India, the wife of Captain R. M. Lloyd Still, I.M.S., of a daughter.
TOOTH.—On March 6th, at Albion-street, Lewes, the wife of Ronald S. Tooth, M.A., M.R.C.S., L.R.C.P., of a son.

DEATHS.

ALLINGHAM.—On March 7th, Christian Philip Sidney Allingham, M.R.C.S., L.R.C.P., aged 40.
ASHWELL.—On March 12th, at The Rope-walk, Nottingham, Herbert George Ashwell, O.B.E., M.R.C.S., aged 74.
HUGHES.—On March 7th, at Downhouse, Whitchurch, Tavistock, Robert Harry Hughes, M.A., M.B. Camb., aged 86.
JAMES.—On March 10th, at Littlehampton, after a short illness, Herbert Noel James, M.B., B.S. Lond., aged 33.
MOREHEAD.—On March 8th, Henry Ruddock Morehead, *M.C.*, L.R.C.P., & S. Edin., late S.M.O. Nigeria, of Sunnyside, Cheddar, aged 48.
SYDENHAM.—On March 7th, 1932, at Pitt House, Dawlish, Devon, George Mervyn Sydenham, M.D., late of Chelwood Gate, Sussex, second son of the late Rev. J. G. and Mrs. Sydenham, of Cullompton and Exmouth, aged 62.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

ROYAL FREE HOSPITAL.—At the annual meeting last week it was stated that in 1931 the expenditure was £90,813, which left a deficit of £5355. There were 6124 in-patients and 58,083 out-patients. The Nurses' Home is to be completed at a cost of £65,000, all of which, with the exception of £10,000, has been provided for. Closer and longer union with the medical school has been arranged by an agreement for 50 years. The dental clinic has made great progress, as also has the orthodontic department; it is hoped to open the cleft palate and hare-lip ward at an early date. A ward in the maternity department is to be named after the late Dame Mary Scharlieb.

DEBT OF LIVERPOOL SOUTHERN HOSPITAL.—The overdraft of this hospital having reached £36,732 the bank has refused to honour any more cheques until there are funds to meet them. Meanwhile arrangements have been made for meeting current expenses. The secretary states that unless an increased income can be obtained certain wards will have to be closed and paying patients only accepted, or the hospital will have to be shut up entirely. A committee has been appointed to consider the position.